

**Cash Register**

# **ECR 7900**

## **SERVICE MANUAL**

Code Y108540-8



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Olivetti S.p.A.  
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Via Jervis, 77- 10015 Ivrea (ITALY)  
[www.olivetti.com](http://www.olivetti.com)

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**ATTENZIONE**

Pericolo di esplosione se la batteria non viene sostituita in modo corretto.  
Sostituire solo con un tipo uguale o equivalente raccomandato dal costruttore.  
Eliminare le batterie usate seguendo le istruzioni del costruttore.

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## **PREFACE**

This Service Manual is addressed to the field engineers who will install and service the cash register. It also provides product maintenance guidelines.

## **SUMMARY**

This manual is divided into five chapters.

The first two chapters describe the operating, functional checks and maintenance procedures.

Chapter 3 describes the disassembly and reassembly procedures, Chapter 4 gives troubleshooting/repair information while Chapter 5 describes the electronic circuitry.

## **PREREQUISITES**

The topics described in this manual require knowledge of similar products.

## **REFERENCE DOCUMENTATION**

- Instruction Manual (provided with the product)
- Spare Parts Catalogue

DISTRIBUTION: General

LAST EDITION: January 2008

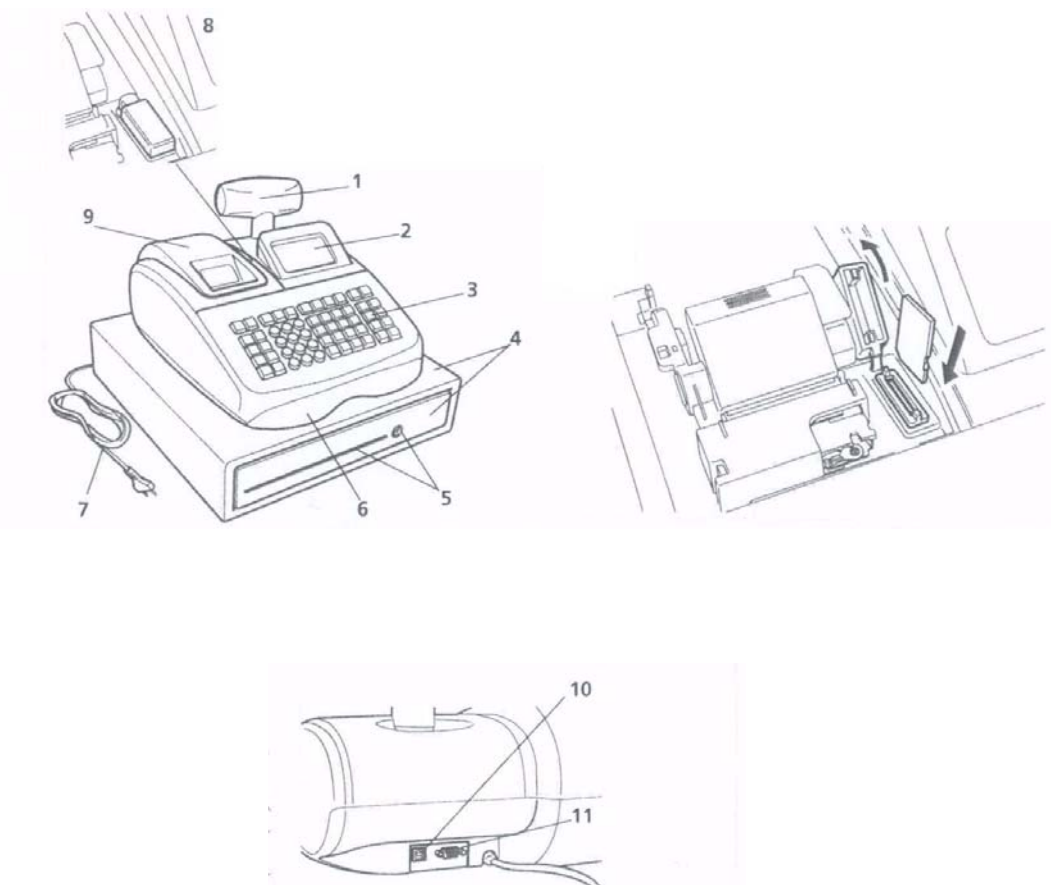


## MAJOR FEATURES

- 99 departments that can be grouped into up to 10 merchandise categories;
- Up to 3,000 Price Look-Ups (PLU) with the possibility of associating a department and tax status to each;
- 15 clerk numbers to monitor the sales of individual employees with programmable Clerk security system;
- Maximum 12,000-line internal Electronic Journal memory, substantially expandable via SD card;
- Thermal printer with journal record or receipt printing capabilities;
- PLU creation for barcoded articles and barcode programming;
- Cash register programming via computer;
- Quantity entries using decimal point;
- Training mode facility with related password;
- Replaceable keycaps;
- Receipt on/off capabilities;
- Programmable names for departments, department (merchandise) groups, clerks, PLUs, foreign currencies and payment media;
- Customer sales receipt header and footer personalization and logo creation via PC;
- Special rounding capabilities for Swiss, Danish and Swedish and Euro currencies;
- Detailed department programming;
- 4 foreign currency exchange rates with related currency descriptors;
- Cash, check, charge card and 6 other credit card tender media keys, with change tendered on all payments; 4 different VAT rates, with temporary override;
- e Sales transaction hold and recall function;
- Battery back-up protection for sales transaction and programming data;
- Programmable clerk operating limitations for enhanced security;
- Payment transfer from one payment media to another after transaction completion;
- Single-line customer display with programmable scrolling messages;
- LCD operator display with Menu system f or accessing all cash register functions;
- e Optional passwords for Manager mode, X report mode and Programming/Z report modes;
- e PLU rapid inquiry key;
- e PLU fast programming key;
- e Programmable VAT details printing on sales receipts;
- e Multi-lingual interface f or customer receipts, management reports and display messages in Danish, Dutch, English, French, German, Portuguese, Spanish and Swedish;
- e User-defined captions in any language for printing on receipts and reports;
- e Keypad personalization through reassignment of keys;
- Programmable key sequences executed by actioning single chain function keys;
- Sales function selection via pop-up lists;
- Barcode reader connectivity.

## ECR 7900 CASH REGISTER COMPONENTS

With reference to figure:



1. Customer display.
2. Operator display.
3. Keypad.
4. Cash drawer and box.
5. Cash drawer lock and slot.
6. Item deposit drawer.
7. Power cord.
8. Storage Device (SD) - under printer compartment cover.
9. Printer compartment cover with receipt output window.
10. USB interface for connecting the computer for cash register programming. See the note below.
11. RS232 serial interface for barcode reader.



**NOTE:** From the company website you can download the software needed to program the cash register directly from your computer.



# CASH REGISTER SPECIFICATIONS

## Technical Characteristics

Listed below are the technical characteristics of this cash register model.

Type: Electronic cash register with clamshell thermal printer, 10 department groups, 99 departments, 15 decks, up to 3,000 PLU settings. Max. 12,000-line Electronic Journal internal memory, expandable via memory storage device. Removable cash drawer.

Displays: 160x80 dot, tiltable, Operator LCD for displaying all transaction data with menu system for cash register programming. 1 0-digit Client alphanumeric display. Symbols for change, subtotal, minus, total, foreign currency value, department number and item count shown.

Capacity: 8-digit input and readout

Printer: 24-column line thermal printer with drop-in paper loading.

Paper supply: 58.5 ± 0.5 mm thermal paper.

Batteries: 3 standard 'AA' size batteries which safeguard memory contents in the event of power failures.

Technology: CMOS RAM.

Powercons. Standby 12.1 W, Operating 41.8W.

Operating Temperature: 32 — 104°F (0°C — 40 °C)

Dimensions: 10 mm (W) x 430 mm (D) x 294 mm (H)

Weight: 9,9 Kg (21,82 lbs)

## SAFETY PRECAUTIONS

The power socket for this cash register must be located near the machine and must be easily accessible.

Do not use this cash register outdoors in the rain or near any liquid.

## MAINTAINING THE CASH REGISTER

Provided below is information on how to maintain the cash register.

**Note:** Before cleaning the cash register, make sure it is powered off and/or unplugged from the wall outlet. Before unplugging the cash register from the wall outlet, make sure that three charged AA standard backup batteries are installed in the battery compartment. All data stored in memory will be cancelled if you unplug the cash register from the electrical wall outlet without back-up battery supply.

1. Keep all liquids away from the cash register so as to avoid spills which could damage the electronic components.
2. To clean the cash register firstly turn it off and/or unplug it from the wall outlet (be sure the back-up batteries are installed), then use just a damp cloth. Do not use corrosive substances such as solvents, alcohol, petrol, or abrasive components.
3. If the cash register is stored in extreme hot or cold temperatures (0 °C – 40 °C), allow the temperature inside the cash register to reach room temperature before turning it on.
4. DO NOT attempt to pull the paper tape when the cash register is printing or when you are loading paper. Always use the [Feed] key to feed paper. Pulling the paper tape could damage the print mechanism.

# UNPACKING AND SETTING UP THE CASH REGISTER

## STANDARD ACCESSORIES

The cash register comes with the following items:

- One black plastic journal winder spindle
- One roll of standard paper tape
- Three standard 'AN' size batteries for the battery back-up system
- The multilingual User's Guide, Reference Guide in English and Warranty Card + Setup Poster
- A set of keys for locking the cash drawer

Make sure that the cash register and all of the above items are included in the shipping canon.

Open the cash register's shipping carton and carefully withdraw each component. Make sure that the cash register and all its accessories, listed in the section entitled Standard Accessories, are present in order to setup the cash register by following these guidelines:

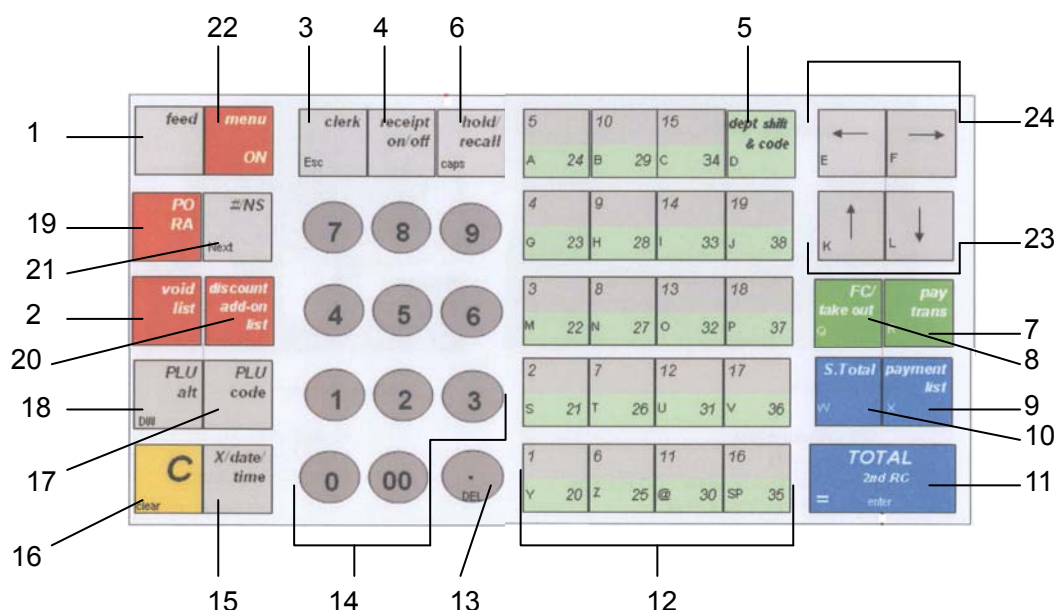
1. Place the cash register on a level, stable, vibration-free and dust-free surface. Make sure it is near a power outlet compliant with the latest safety standards.
2. Plug the cash register into a power outlet compliant with the latest safety standards.
3. Insert memory backup batteries as explained in the section entitled Inserting/Replacing Batteries. Do not insert the batteries unless the cash register is plugged into an electrical power outlet.

**WARNING:** The machine must be plugged into an electrical outlet before you insert the batteries.

4. Load the thermal paper roll as explained in the section entitled Loading Thermal Paper.
5. Set the desired program options as explained in the section Cash Register Programming.

## THE KEYPAD FOR ECR 7900

The figure below shows the keypad layout



### KEYPAD FUNCTIONS

The keys described here are those configured by default on the cash register keyboard, shown in figure 5. The symbol (\*) indicates that the key is also used in caption programming.



**NOTE:** The keys can be reconfigured using the Free **Key Layout** option in “Advanced Settings”, if required.



1. - Advances the receipt or journal paper one me feed; advances the paper continuously when held down. Interrupts report printing when kept depressed.



2. - Pop-up list (2) allowing **EC/VOID**, **FULI VOID** or **REFUND** operations to be performed. As **EC/VOID**, deletes the last item entered, and corrects a particular entry after it is processed and printed. **FULL VOID** deletes full entries after a subtotal. As **REFUND**, subtracts an item that is returned for refund; sales and activity totals are also rectified.



3. - As **[CLERK]** confirms the clerk code entered. As the **[ESC]** key in programming mode, displays the previous menu or exits caption programming.



4. - Toggles the cash register between printing and not printing the sales receipt in registration and manager modes.



5. - Allows price entries for departments 20-38 and 39-99. For departments 20-38, press this key before pressing the corresponding department key. For departments 39-99, press this key, manually enter the department number using the numeric keypad and then press this key again.



6. - (\*) Holds and then recalls a sales transaction so that a second transaction can be performed in the meantime. In caption programming, toggles between caps on/off to allow captions to be written in upper or lower case letters.



**7.** - (\*) Transfers payment from one form of payment media to another after the sales transaction is finalized.



**8.** - -(\*) Pop-up list (5) allowing FC or TAKE-OUT sales operations to be performed. As FC, automatically calculates and displays the value in foreign currency of the subtotal of a sale or of a particular amount registered. As the TAKE-OUT key modifies temporarily the tax status associated with a PLU code.



**9.** -(\*) Pop-up list (1) allowing transaction payment to be registered to a check, charge card, or one of six credit cards.



**10.** -(\*)Subtotals a sale



**11.** - As the [TOTAL]key totals exact cash transactions, computes change and totals transactions that are split tendered with check, credit card and/or cash. Pressed a

second time, prints one or more copies of the last receipt, depending on how multiple receipts are programmed (see "Receipt Printing Mode"). As [ENTER], in Programming mode, selects a menu option when it is highlighted, or confirms the data entered for a form field.




**12.** (\*) Registers single or multiple item sales to departments numbered between 1 and 38. To enter a department number from 1 to 19, press the corresponding key. To enter a

department number from 20 to 38, press first the  key, then the corresponding

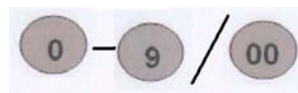
department key. For department numbers from 39 to 99, see  above.

In caption programming, these keys can be used to input the characters indicated on the related key as indicated in the Character Table. You can define clerk names, receipt header/footer, department names, department group names, PLU product names, currency identifiers and credit card


captions. As the [SP] key,  can be used to add spaces between characters and to confirm entry of repeated characters.



**13.** - (\*) Enters a decimal point for defining product quantities with decimals during sales transactions. In caption programming, as the [DEL] key, it performs the typical backspace function for deleting the last character entered.





**14.** -(\*) Input amounts, indicate multiple items, add and subtract amounts and percentages, and input department numeric codes from 39 to 99


(see"  "above).



**15.** - When operated outside of a sales transaction, displays setup information: the current date and time, clerk number, Electronic Journal status and number of free EJ lines.

Using  and  the LCD contrast can be adjusted. When operated during a sales transaction, allows multiple quantities to be specified for a sales item.



**16.** - (\*) Clears an entry made from the numeric keypad or with  before finalizing a transaction with a Department or function key. Also used to clear error conditions. In caption programming, deletes any caption characters entered before pressing

In **Off mode**, activates menu for resetting cash register.



**17.** - Price look-up function. Registers the preset price of an individual item to the appropriate department. When programming PLUS, to display a given PLU, enter its number then press this key.



**18.** - (\*) Temporarily overrides a price that was assigned to a PLU number. During caption programming, when pressed before a character, sets the character as double width.




**19.** - Pop-up list (4) allowing Paid Out (P0) or Received on Account (RA) transactions. As the P0 key registers any money taken out of the cash drawer that is not part of a sale. AS the RA key registers any money received on account that is not part of a sale, for example, the start-up money put in the drawer at the start of each business day can be registered as RA.



**20.** - Pop-up list (3) allowing direct/percent discounts and add-on operations: as the **1%** +/- or **2%** +/- key, when appropriately programmed, applies a preset percentage reduction or add-on to the price of an item or to the sales total. As the **1+/-** or **2 +/-** key, subtracts or adds an amount from/to an item or sales total.




**21.** - Opens the cash drawer without registering any amount or when changing cash for a non-sales transaction. When programming entities such as clerks PLUs, depts and so on, press  to display the next item in numeric sequence (i.e.: clerk O1, clerkO2, ..... and so on).



**22.** - When the operator display is off, this key switches it on. When the display is on, pressing this key displays the Main menu. The Main menu contains the Off mode option which you can use to switch the operator display off. During a clerk transaction, allows you to switch to Manager mode to perform operations disabled for the clerk. Pressing the key again afterwards, switches back to the clerk transaction.



**23.** - In Programming mode, these keys can be used to move through the menu options and form fields in the direction indicated on the key.

When the menu item required is highlighted, press  to select it. When navigating forms, if me numbers are present on the left, jump to the line you want by entering its number followed by either arrow key.



**24.** - In Programming mode, when selecting data for preset value fields, use these keys to scroll through the values available, highlight the value wanted, and then select with



## OPERATOR AND CUSTOMER DISPLAYS

The operator LCD display has a Menu system providing access to all cash register functions. You can raise and tilt the display to obtain the most comfortable viewing position. The pop-up, single-line, customer display can be raised and swivelled to obtain the most favorable position for customer viewing. When sales transaction data is not displayed, scrolling messages can be programmed to appear according to the cash register state (idle, off and so on).

### SWITCHING THE OPERATOR DISPLAY ON

To switch on the operator display press the  key on the keypad. The Main menu is displayed from which you can select:

- **Registration mode** - to enter sales transactions as a clerk (also in training mode)
- **Manager mode** - to enter all sales transactions as a Manager (also in training mode)
- **X1 & X2 Report mode** - to print X financial reports
- **Z1 & Z2 Report mode** - to print Z financial reports
- **Programming Mode** - to set up the cash register and program sales functions
- **Off mode** - to switch off the menus and the operator display.




See "Using the Menus" for how to navigate the menus.



**NOTE:** The first time you switch on the cash register, it must be initialized (see "Quick Start Programming").

### SWITCHING THE OPERATOR DISPLAY OFF

To switch off the operator display, first terminate any sales transactions, then:


1. Press  to display the **Main menu**.
2. Use  to scroll to the option **Off Mode**.
3. Press .



### SYMBOLS AND MESSAGES


The Operator Display (OD) and Customer Display (CD) symbols and messages can be understood as follows



 (4) n/a Training mode

 (4) n/a Hold mode - A transaction has been temporarily put on hold.


 (4) n/a Recall mode - A transaction on Hold has been recalled for completion.

 (3) n/a Receipts Off - no receipts are issued until  is pressed again.

 (3) n/a EJ nearly – full condition  
(Clerk Id.) n/a If the Clerk System is active, the clerk number/name is displayed after logon at top left.







| (Dept name)  | (Dept Indicates dept number (CD) or no.)  | dept name (OD) entered.  |
|--|---|--|
| <b>Cash</b>  | <b>CA</b>   | Indicates a sales transaction paid by cash.  |
| <b>Check</b>   | <b>Ch</b>   | Indicates a sales transaction paid by check.   |
| <b>Credit</b>  | <b>Cr</b>   | Indicates a sales transaction paid by credit card.   |
| <b>Charge</b>  | <b>Cr</b>   | Indicates a sales transaction paid by charge card.   |
| -  | -   | Displays a minus sign if the subtotal or cash tendered total is a negative number due to a return or refund. |
| <b>Change</b>  | <b>C</b>  | Indicates that amount displayed is the change due to the customer.   |
|  | <b>ST</b>   | Indicates that the amount shown is the subtotal of a transaction, including sales tax if applicable          |
| Total  |   | Indicates the total due from the sales transaction (OD, top-left)  |
| (FC name)  |  | Indicates an amount registered in a foreign currency (left-side CD)  |
| n/a  | (no.)   | Indicates amounts entered and sales totals, max. 8-digits (rightside CD).                                    |
| <br>(4) | n/a   | Indicates that a Take-out tax rate is applied to the transaction.  |

n/a = not applicable.

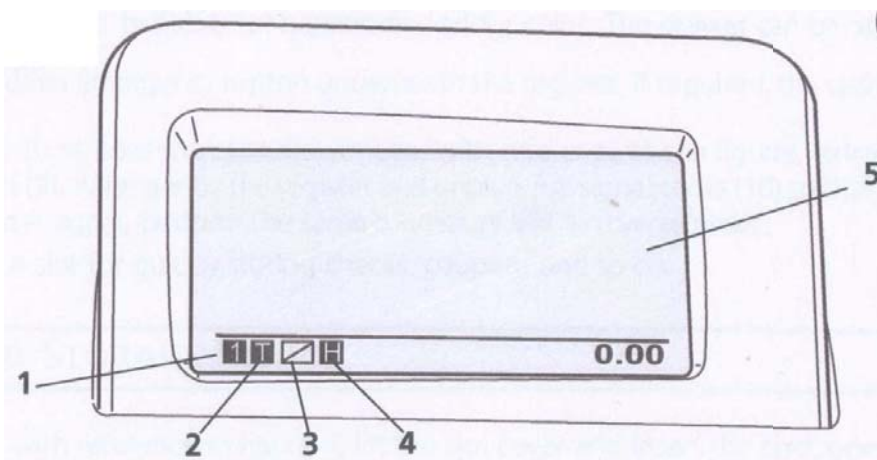
These symbols clear automatically when you start the next entry or press the  key.



## PROGRAMMING MODE – Operator Display

-  Ref. (1) Navigation Mode
-  Ref. (1) Data Entry Mode – Lowercase
-  Ref. (1) Data Entry Mode – Uppercase letters
-  Ref. (2) In Navigation Mode, field selection
-  Ref. (5) In Navigation Mode, indicates a menu option (appears on the right)
-  Ref. (2) Manager mode

## PROGRAMMING MODE – Operator Display



## PRINTER COMPARTMENT

The printer compartment is on the top left-hand side of the cash register. It houses the thermal paper roll, journal winder spindle, back-up batteries and the thermal printer. This cash register uses standard 2 1/4" (57 mm) thermal paper.

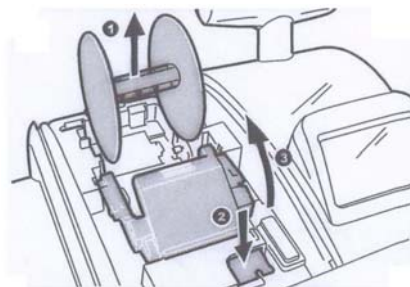
### LOADING THERMAL PAPER FOR **ECR 7900 MODELS**

Proceed as follows to load the cash register with paper.

1. Make sure the cash register is plugged into a grounded power outlet.
2. Unlock, open and remove the printer compartment cover, then remove the plastic journal winder spindle.

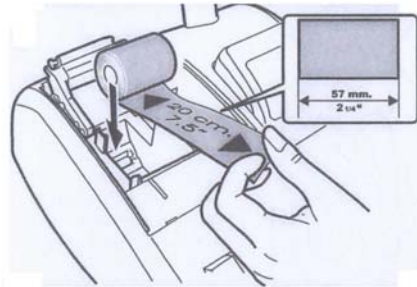


3. Release and lift the clamshell mechanism as shown in the following figure.

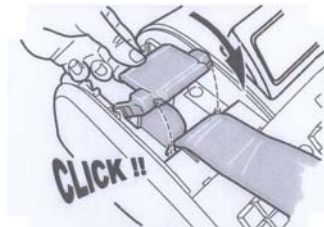


4. With a pair of scissors, cut the end of the paper tape to create a straight, even edge so that the paper can be properly fed through the print mechanism.

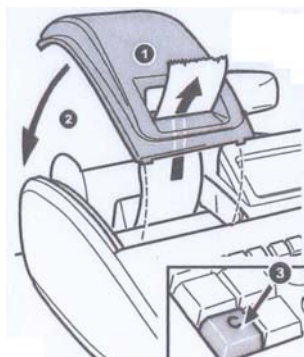
5. Set the paper roll in the bottom of the printer compartment so that the paper feeds out from the bottom of the roll.



6. Lower the clamshell mechanism and secure it in place by pushing it all the way down until it clicks into place.



7. Replace journal winder with wheel to right of compartment.
8. Pass the edge of the customer receipt through the receipt window on the compartment cover.
9. Insert the edge of the paper into the paper slot as shown below. Reposition and close the printer compartment cover.





# 1. PRODUCT OUTLINE

## 1-1. HARDWARE

The terminal uses

32-bits single chip microcomputer.

The CPU has...

128K bytes of internal MASK ROM and 10k bytes internal RAM

512kbytes FROM

512kbtes S-RAM of external memory.

This terminal uses 160 x 80 dots LCD and 10-digits 16 segment VFD.

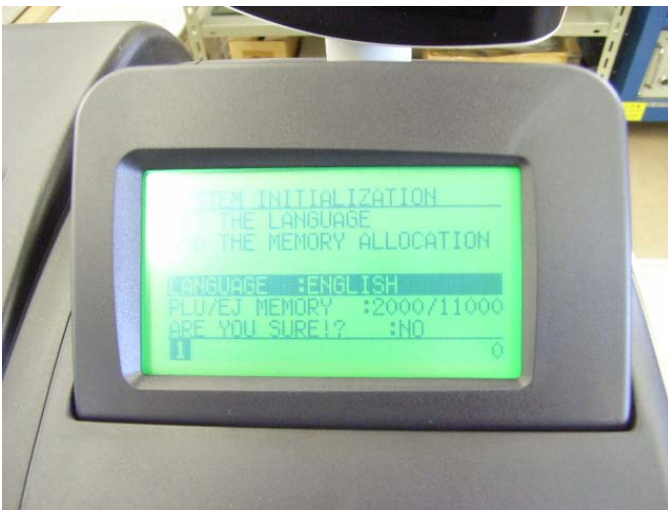
This terminal also has a battery-backed up clock that keeps track of the month, day of the year, hour and minute.

The printer is SII LTFC-235, that is a line thermal printer developed for ECR use.

## 1-2. DISPLAY

Front Display is 160 x 80 dots Multiline LCD.

Rear display is 10-digits 16 segment VFD.



<Front Display>

160 x 80 dot matrix  
MultiLine LCD  
Adjustable Display Angle, LCD Housing  
View area : 89.0mm x 47.5

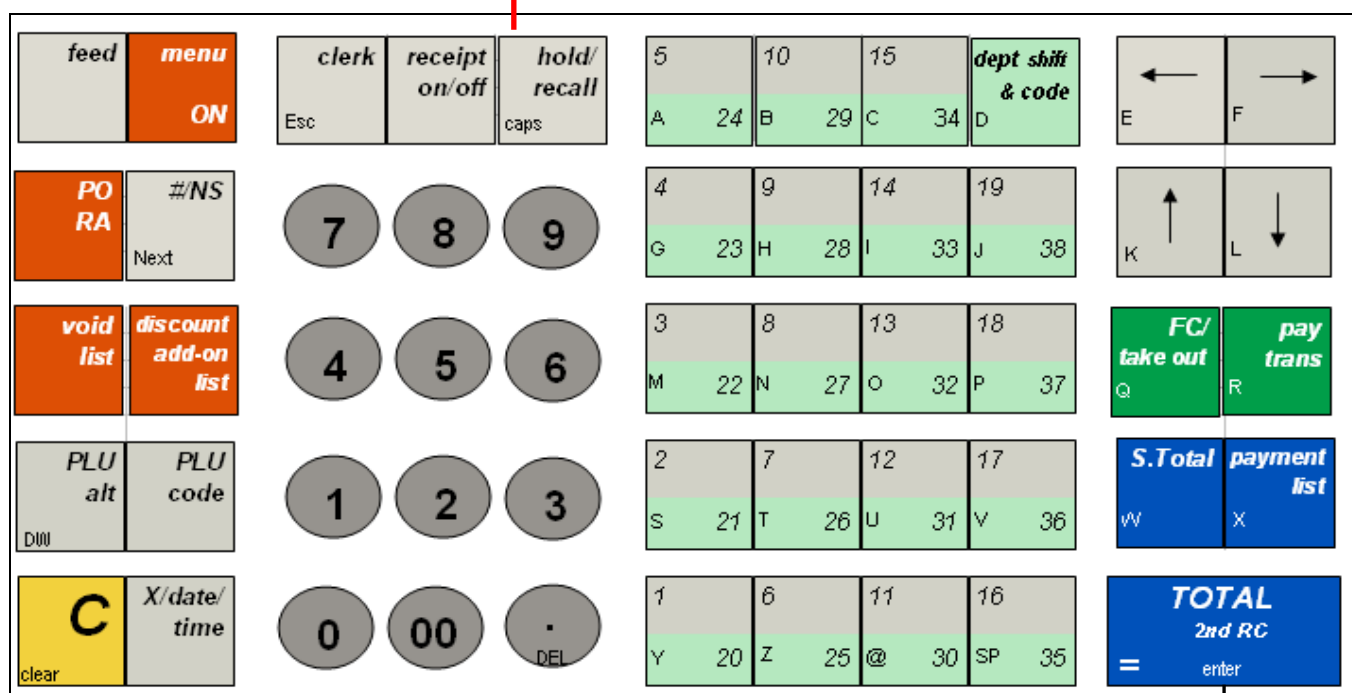
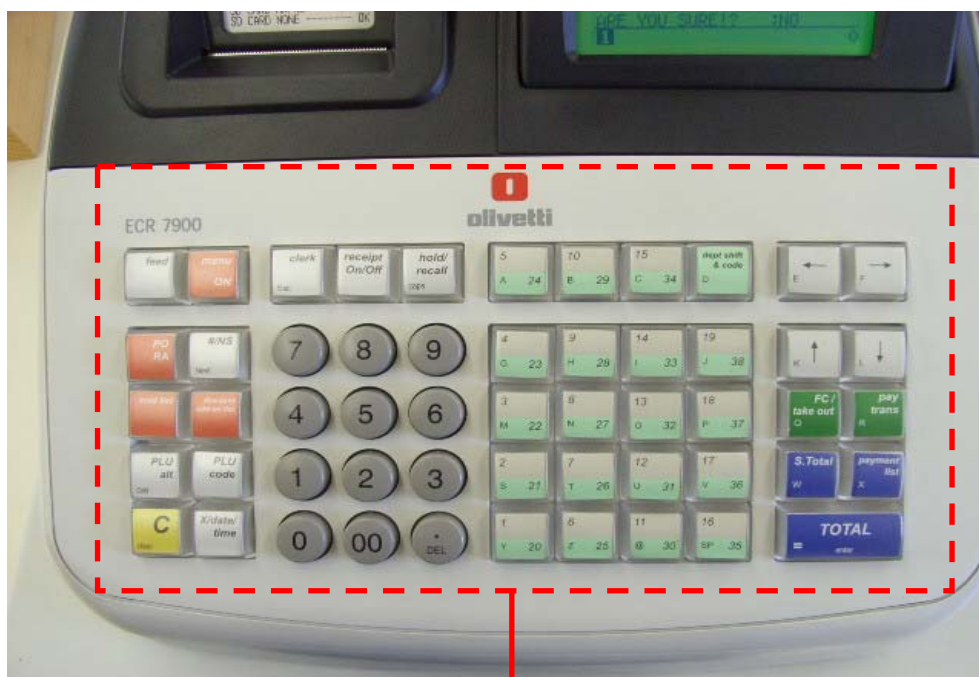


<Rear Display>

10 digit VFD  
1 x Alphanumeric  
14mm C.H. x 4.9mm

### 1-3. KEYBOARD

The keyboard consists of Stroke 42 keys with key caps (except numeric keys).



Numeric keys

Department keys and letters for programming

Amount tender key

#### 1-4. DRAWER

The drawer type is DSCA, 4 Bill / 8 Coin with D/DRAWER.



D/Drawer



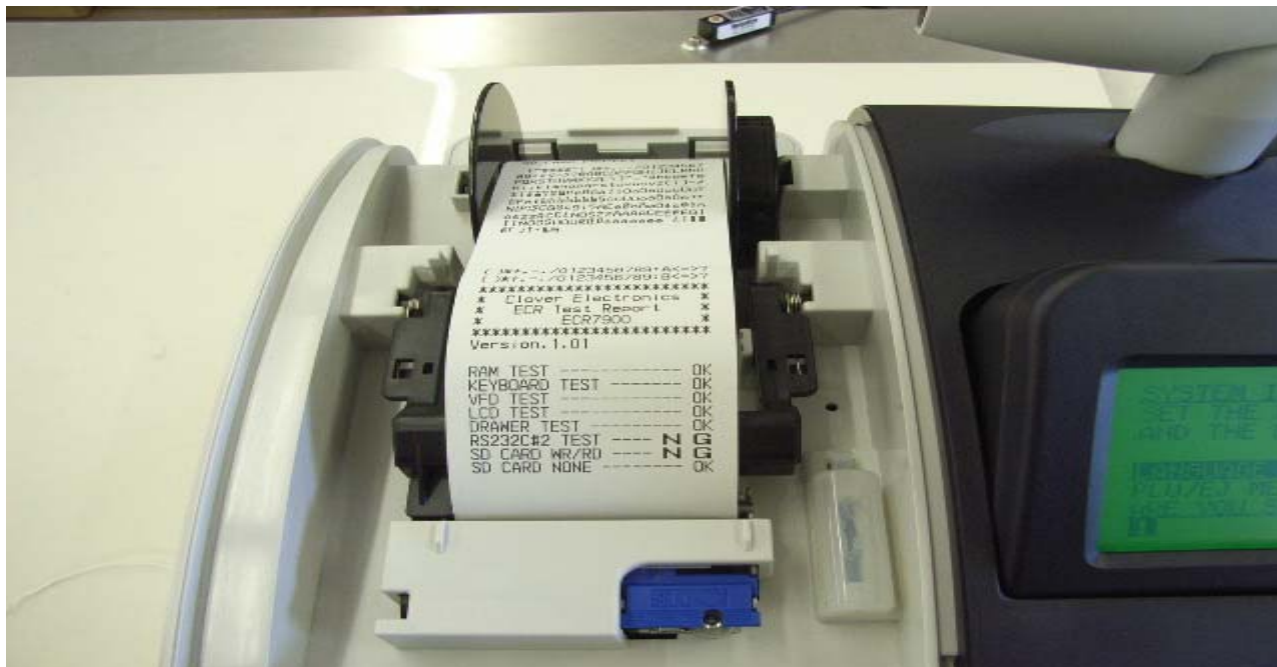
4 Bill tray

8Coin tray



## 1-5. PRINTER

The printer is SII LT-PC-235, that is a line thermal printer developed for ECR use.  
58mm 1 Station Thermal Printer.



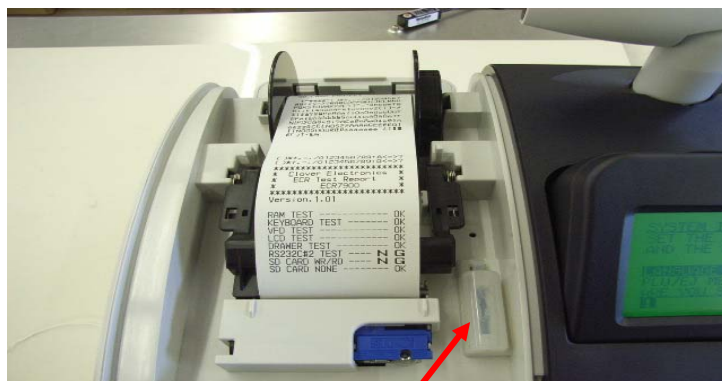
## 1-6. INTERFACE

RS232C for Barcode Reader, USB for PC communication and SD memory card slot.



USB I/F for PC

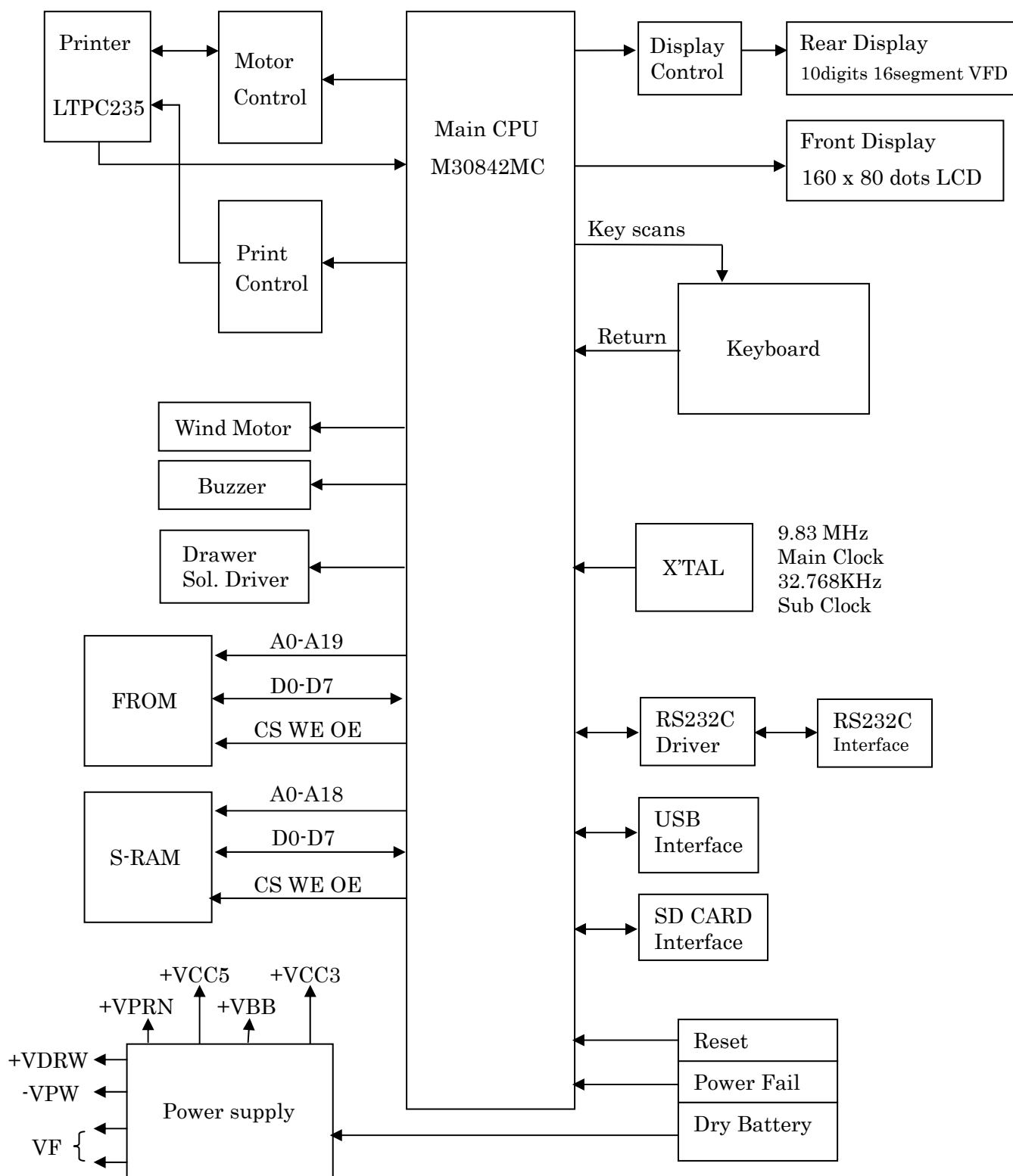
RS232C for  
Barcode Reader



SD Memory  
card slot



## 1-7 SYSTEM BLOCK DIAGRAM



## 2. TROUBLE SHOOTING GUIDANCE

In the event following abnormal symptom happened, refer to the solution corresponding to its symptom.

| No. | Symptom                              | Check point / Detailed symptom   | Page   |
|-----|--------------------------------------|--|--------|
| 1   | No Power.                            | Check the Power supply circuit. - - - Try STEP 1&2   | P.9-11 |
|     |                                      | If Power supply circuit is OK, check RESET circuit.  | P.15   |
| 2   | Winding reel does not work.          | Start up Diagnostic software.  | P.17   |
|     |                                      | If it doesn't work through the Diagnostic software, start Diagnostic software again and check voltage. | P.17   |
| 3   | Main display does not work properly. | No display but backlight turns on.   | P.18   |
|     |                                      | Display OK but backlight does not turn on.   | P.18   |
|     |                                      | No display / No backlight.   | P.18   |
| 4   | Rear display does not turn on.       | Check the power supply of the display tube.  | P.19   |
| 5   | Key operation unable.                | All keys do not work at all.   | P.21   |
|     |                                      | Only a specific key does not work.   | P.21   |
| 6   | Drawer does not open.                | Drawer does not open when it is not locked by a drawer lock key.                                       | P.22   |
| 7   | Drawer does not close.               | Drawer remains opened or does not close.   | P.26   |
| 8   | Buzzer does not beep.                | No buzzer sound when [clear] key is depressed.   | P.23   |
| 9   | Cannot work memory backup.           | Check whether the batteries are supplied or not.   | P.24   |
|     |                                      | Check the voltage of each battery.   | P.24   |
|     |                                      | Check voltage.   | P.24   |
| 10  | Can not print properly.              | Cannot print or cannot Feed paper.   | P.31   |
|     |                                      | Faded print or run print.  | P.31   |
|     |                                      | Cannot cancel Head-up sensor error   | P.31   |
|     |                                      | Cannot cancel Paper-end sensor error   | P.31   |
|     |                                      | Head-up sensor or Paper-end sensor does not work.  | P.31   |
| 11  | Scanner does not work.               | Scanner head lamp does not light up when power ON.   | P.33   |
|     |                                      | Scanner head lamp lights up but can't read a barcode.  | P.33   |
| 12  | Cannot use USB I/F                   | Cannot work the USB port.  | P.33   |
| 13  | Cannot use SD card                   | Cannot write or read the data for SD card.   | P.33   |

## 3. CIRCUITRY

### 3-1 POWER SUPPLY CIRCUIT

#### +VDRW

+VDRW is generated using the AC input across pins 3 of CN12. This AC voltage is rectified by D15, a 1SR154 diode. The resulting DC voltage is about +24V. This voltage is used by the drawer solenoid and the buzzer.

#### VCC5

VCC5 is generated using the 13V AC input across pins 1 and 2 of CN12. This AC voltage is rectified by the RS402 bridge rectifier and filtered by EC14 a 15000uF capacitor.

The resulting DC voltage is about +12V. It is supplied to the input of U9, a M5291 comparator and then it outputs +5V.

#### VCC3, VBB

VCC3 and VBB are generated using the VCC5. VCC5 is supplied to the input of U15, a BA00CC0WFP regulator and then it outputs about 3.6V.

After 3.6V passes through D12, it becomes 3.3V as VCC3.

After 3.6V passes through D13, it becomes 3.3V as VBB.

#### VPRN

VPRN the printer motor voltage is generated using the 13V AC input across pins 1 and 2 of CN12. This AC voltage is rectified by the RS402 bridge rectifier and filtered by EC14 a 15000uF capacitor.

The resulting DC voltage is about +12V. It is supplied to the collector of Q10, a 2SD1415 transistor.

This base voltage is controlled by ZD7. This emitter voltage is about +7.6V.

#### -VPW

The -VPW circuit uses 26.5V AC across pins 4 and 5 of CN12.

This AC voltage is rectified by D4, a 1SR154 diode and filtered by EC13.

The resulting DC voltage is about -30V. It is supplied to the collector of Q12, a 2SA1284D transistor, and base voltage is controlled by ZD8.

-VPW is approximately -28V DC. This voltage is used by the display.

#### VF

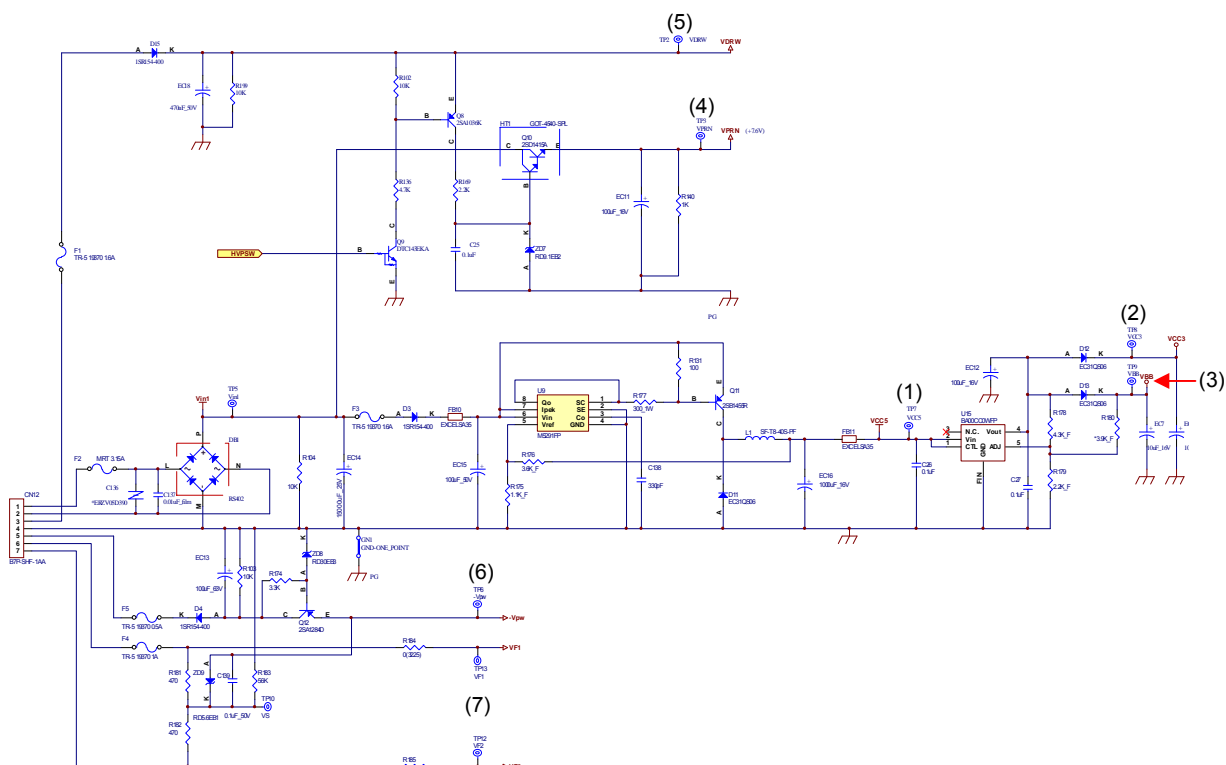
The filament voltage, VF1, VF2 are used by the display tube.

Its AC input is 4.3V, and uses a ground reference -23V from the -28V circuit dropped across ZD9 and R181, R182, a 470 ohm resistor.

#### Fuse for Secondary side.

|    |            |                 |
|----|------------|-----------------|
| F1 | 250V 1.6A  | TR-5 19370 1.6A |
| F2 | 250V 3.15A | MRT3.15A        |
| F3 | 250V 1.6A  | TR-5 19370 1.6A |
| F4 | 250V 1A    | TR-5 19370 1A   |
| F5 | 250V 500mA | TR-5 19370 0.5A |

## POWER SUPPLY CIRCUIT continued



## Trouble shooting

### - STEP 1

Check the voltage (DC +5.0V) at point (1).

If it does not output properly - - Check FUSE F2 & F3 continuity and replace it if OPEN.

Check the voltage (DC +3.3V) at point (2).

If it does not output properly - - Check FUSE F2 & F3 continuity and replace it if OPEN.

Check the voltage (DC +3.3V) at point (2).

If it does not output properly - - Check FUSE F2 & F3 continuity and replace it if OPEN.

Check the voltage (DC + 7.6V) at point (4).

If it does not output properly- - Check FUSE F1&F2 continuity and replace it if OPEN.

Check the voltage (DC +24V) at point (5).

If it does not output properly- - Check FUSE F1 continuity and replace it if OPEN.

Check the voltage (DC -28V) at point (6).

If it does not output properly- - Check FUSE F5 continuity and replace it if OPEN.

Check the voltage (AC 3.9V) at point (7).

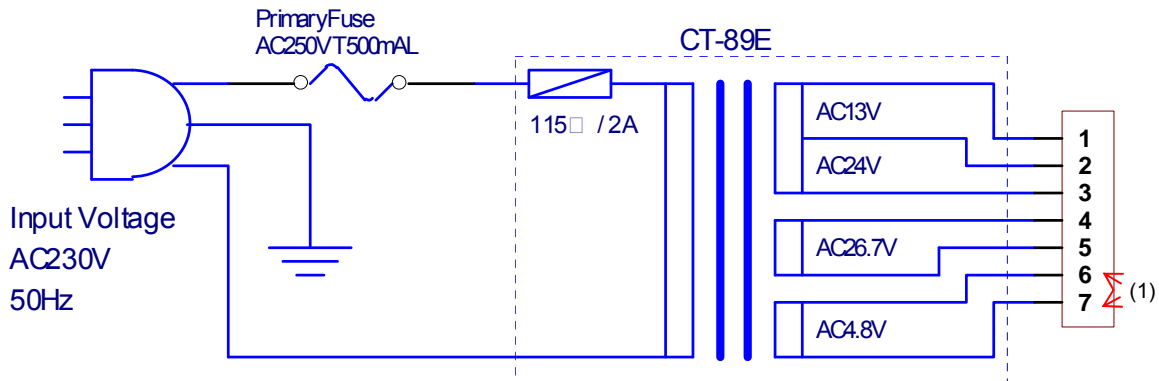
If it does not output properly- - Check FUSE F4 continuity and replace it if OPEN.

### - STEP 2

After replacing FUSE at STEP 1 but the FUSE opens again.- - Replace Main board.

No voltage at all the points from (1) to (7). - - Replace Transformer.

### 3-2. TRANSFORMER WIRING DIAGRAM



#### **Trouble shooting**

##### **- Check the Continuity at Primary FUSE.**

If it's OPEN. - - - Replace Fuse.

After replacing FUSE but it opens again. - - - Check Power Supply circuit. (P.9, 10)

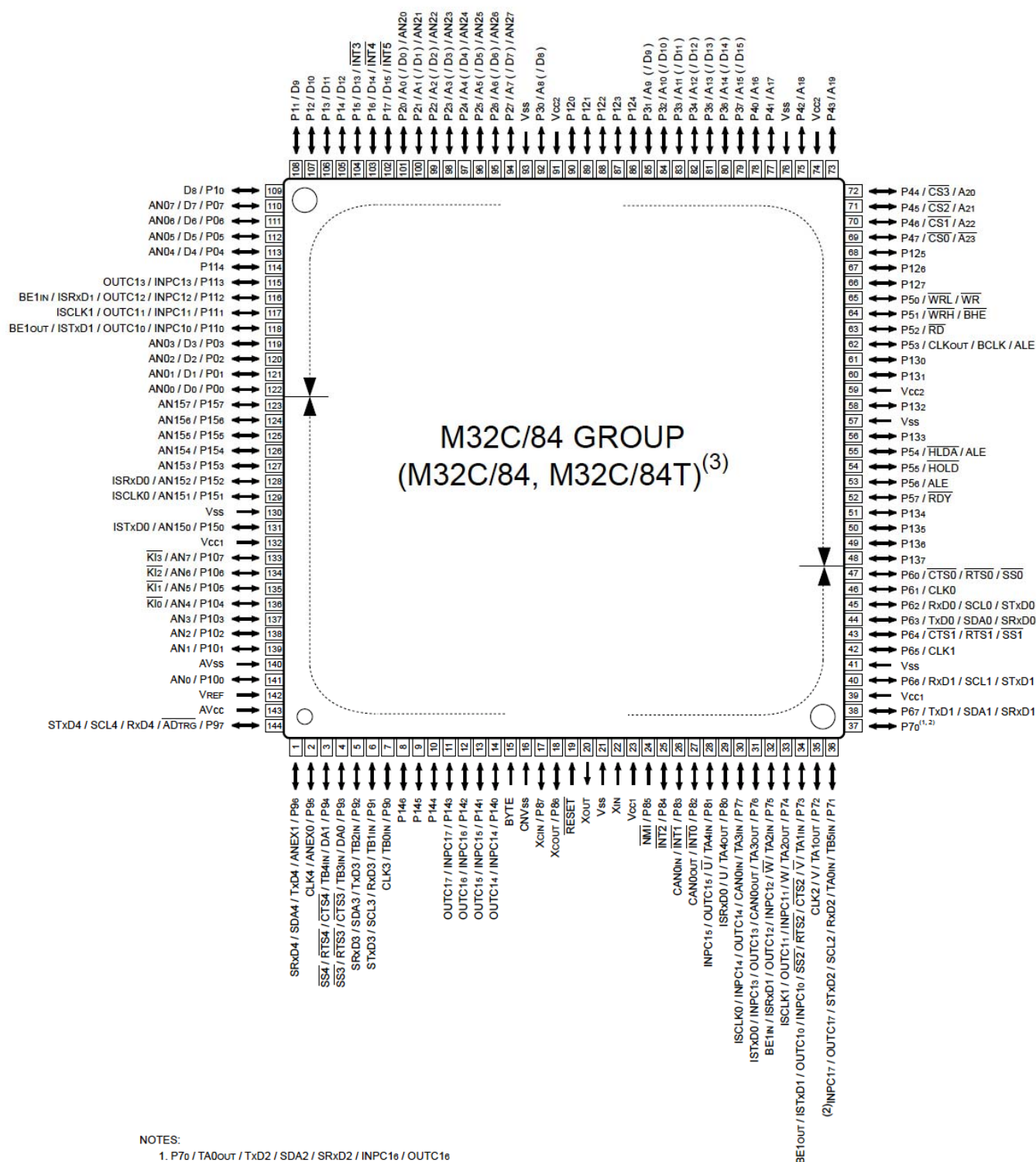
##### **- Check the Thermal Fuse.**

Check the voltage (AC 4.8V) at point (1) (6 pin and 7 pin).

If it outputs almost 0V - - - Replace Transformer.

### 3-3. M30842MC MICROCOMPUTER

Refer to the specification (attached).



**PLQP0144KA-A**  
(144P6Q-A)

# Port Assignment for ECR7900 (M30842MC)

Port Assign List  
M32C/84 Group 144Pin Version

MODEL: ECR7900  
CPU : M30842MC-xxxGP

| Port # | # | P.n. Specification<br>P.n. Name   | I/O Type | Signal Name | Signal Specification        | I/O | P.n. Term | I/N T/A<br>I/O Data | PF (Backup)<br>I/O Data | Remark                           |
|--------|---|---|----------|-------------|-----------------------------|-----|-----------|---------------------|-------------------------|----------------------------------|
| P0     | 0 | 122 D0/AN0  | I/O      | D0          | Data Bus b0                 | I/O | P.D       |                     | O                       | Data Bus                         |
|        | 1 | 121 D1/AN01   | I/O      | D1          | Data Bus b1                 | I/O | P.D       |                     | O                       |                                  |
|        | 2 | 120 D2/AN02   | I/O      | D2          | Data Bus b2                 | I/O | P.D       |                     | O                       |                                  |
|        | 3 | 119 D3/AN03   | I/O      | D3          | Data Bus b3                 | I/O | P.D       |                     | O                       |                                  |
|        | 4 | 113 D4/AN04   | I/O      | D4          | Data Bus b4                 | I/O | P.D       |                     | O                       |                                  |
|        | 5 | 112 D5/AN05   | I/O      | D5          | Data Bus b5                 | I/O | P.D       |                     | O                       |                                  |
|        | 6 | 111 D6/AN06   | I/O      | D6          | Data Bus b6                 | I/O | P.D       |                     | O                       |                                  |
| P1     | 7 | 110 D7/AN07   | I/O      | D7          | Data Bus b7                 | I/O | P.D       |                     | O                       | Printer Strobe                   |
|        | 0 | 109 DB  | I/O      | STR1#       | PH Strobe 1                 | O   | -         | O                   | H                       |                                  |
|        | 1 | 108 DB  | I/O      | STR2#       | PH Strobe 2                 | O   | -         | O                   | H                       |                                  |
|        | 2 | 107 D10   | I/O      |             |                             |     |           |                     |                         |                                  |
|        | 3 | 106 D11   | I/O      |             |                             |     |           |                     |                         |                                  |
|        | 4 | 105 D12   | I/O      |             |                             |     |           |                     |                         |                                  |
|        | 5 | 104 D13/INT3#   | I/O      |             |                             |     |           |                     |                         |                                  |
| P2     | 6 | 103 D14/INT4#   | I/O      | SD_CARD     | SD_CARD In                  | I   | P.U       | I                   | I                       | SD CARD                          |
|        | 7 | 102 D15/INT5#   | I/O      | SD_WP       | SD Write Protect            | I   | P.U       | I                   | I                       |                                  |
|        | 0 | 101 A0(/D0)/AN20  | I/O      | A0          | Address Bus b0              | O   | -         |                     | O                       | Address Bus                      |
|        | 1 | 100 A1(/D1)/AN21  | I/O      | A1          | Address Bus b1              | O   | -         |                     | O                       |                                  |
|        | 2 | 99 A2(/D2)/AN22   | I/O      | A2          | Address Bus b2              | O   | -         |                     | O                       |                                  |
|        | 3 | 98 A3(/D3)/AN23   | I/O      | A3          | Address Bus b3              | O   | -         |                     | O                       |                                  |
|        | 4 | 97 A4(/D4)/AN24   | I/O      | A4          | Address Bus b4              | O   | -         |                     | O                       |                                  |
|        | 5 | 96 A5(/D5)/AN25   | I/O      | A5          | Address Bus b5              | O   | -         |                     | O                       |                                  |
|        | 6 | 95 A6(/D6)/AN26   | I/O      | A6          | Address Bus b6              | O   | -         |                     | O                       |                                  |
| P3     | 7 | 94 A7(/D7)/AN27   | I/O      | A7          | Address Bus b7              | O   | -         |                     | O                       | Address Bus                      |
|        | 0 | 92 A8(/D8)  | I/O      | A8          | Address Bus b8              | O   | -         |                     | O                       |                                  |
|        | 1 | 85 A9(/D9)  | I/O      | A9          | Address Bus b9              | O   | -         |                     | O                       |                                  |
|        | 2 | 84 A10(/D10)  | I/O      | A10         | Address Bus b10             | O   | -         |                     | O                       |                                  |
|        | 3 | 83 A11(/D11)  | I/O      | A11         | Address Bus b11             | O   | -         |                     | O                       |                                  |
|        | 4 | 82 A12(/D12)  | I/O      | A12         | Address Bus b12             | O   | -         |                     | O                       |                                  |
|        | 5 | 81 A13(/D13)  | I/O      | A13         | Address Bus b13             | O   | -         |                     | O                       |                                  |
| P4     | 6 | 80 A14(/D14)  | I/O      | A14         | Address Bus b14             | O   | -         |                     | O                       | Address Bus                      |
|        | 7 | 79 A15(/D15)  | I/O      | A15         | Address Bus b15             | O   | -         |                     | O                       |                                  |
|        | 0 | 78 A16  | I/O      | A16         | Address Bus b16             | O   | -         |                     | O                       |                                  |
|        | 1 | 77 A17  | I/O      | A17         | Address Bus b17             | O   | -         |                     | O                       |                                  |
|        | 2 | 75 A18  | I/O      | A18         | Address Bus b18             | O   | -         |                     | O                       |                                  |
|        | 3 | 73 A19  | I/O      | A19         | Address Bus b19             | O   | -         |                     | O                       |                                  |
|        | 4 | 72 A20/CS#  | I/O      | A20         | Address Bus b20             | O   | -         |                     | O                       |                                  |
| P5     | 5 | 71 A21/CS#  | I/O      | RAMCS#      | SRAM Select                 | O   | P.U       | O                   | H                       | SRAM Expanded SRAM               |
|        | 6 | 70 A22/CS1#   | I/O      | LCSS#       | I/O Select                  | O   | P.U       | O                   | H                       |                                  |
|        | 7 | 69 A23#CS0#   | I/O      | ROMCS#      | FLASH Memory Select         | O   | P.U       | O                   | H                       | Program ROM                      |
|        | 0 | 65 WR# / WR#  | I/O      | WR#         | Write Signal <SIO Mode CS#> | Ost | P.U       |                     | O                       |                                  |
|        | 1 | 64 WR# / BF#  | I/O      | N.C         |                             | (O) | -         |                     | O                       | CPU Control Signal for Flash CPU |
|        | 2 | 63 RD#  | I/O      | RD#         | Read Signal                 | O   | P.U       |                     | O                       |                                  |
|        | 3 | 62 Q Kout / BQ K/ ALF   | I/O      | (BQ K)      | To Gate Array Clock         | O   | -         | O                   | O                       |                                  |
|        | 4 | 55 H DA# / ALF  | I/O      | N.C         |                             | (O) | -         |                     | O                       |                                  |
|        | 5 | 54 HQ D#  | I/O      | EPN#        | SIO Mode EPN#               | (I) | P.U       | I                   | (H)                     |                                  |
|        | 6 | 53 ALF  | I/O      | N.C (ALF)   |                             | (O) | -         |                     | O                       |                                  |
|        | 7 | 52 BD#  | I/O      | N.C         | Fixed High                  | (I) | P.U       | I                   | (H)                     |                                  |
| P6     | 0 | 47 CTS0# / RTS0# / SS0#   | I/O      | VED_CS0#    | Lower Display Select        | O   | P.U       | O                   | H                       | Display Control                  |
|        | 1 | 46 Q K0   | I/O      | VED_Q K     | Display Tx Clock            | O   | P.U       | O                   | H                       |                                  |
|        | 2 | 45 RxD0 / SCL0 / STXD0  | I/O      | VED_CS1#    | Upper Display Select        | O   | -         | O                   | H                       | SD CARD for Flash CPU            |
|        | 3 | 44 TxD0 / SDA0 / SRXD0  | I/O      | VED_TXD     | Display Tx Data             | O   | P.U       | O                   | I                       |                                  |
|        | 4 | 43 CTS1# / RTS1# / SS1#   | I/O      | SD_CS#      | SD_CS                       | O   | -         | O                   | H                       |                                  |
|        | 5 | 42 Q K1   | I/O      | SD_QK       | SD_QK                       | O   | -         | O                   | I                       |                                  |
|        | 6 | 40 RxD1 / SCL1 / STXD1  | I/O      | SD_D1       | SD_Data In                  | I   | -         | I                   | I                       | SD CARD                          |
|        | 7 | 38 TxD1 / SDA1 / SRXD1  | I/O      | SD_D0       | SD_Data Out                 | O   | -         | O                   | I                       |                                  |
| P7     | 0 | 37 TA0out / TXD2 / SDA2 / SRXD2 / NPC16 / QJTC16                        | I/O O.D  | TxD2        | RS232C #2                   | O   | P.U       | O                   | I                       | RS232C #2 for USB                |
|        | 1 | 36 TBSi n/ TA0i n/ RxD2 / SCL2 / STXD2 / QJTC17 / NPC17                 | I/O O.D  | RxD2        | RS232C #2                   | I   | P.D       | I                   | I                       |                                  |
|        | 2 | 35 TA1out / V/I Q K2  | I/O      | CTS2#       | RS232C #2                   | I   | P.D       | I                   | I                       |                                  |
|        | 3 | 34 TA1i n/ V/I CTS2# / RTS2# / SS2# / NPC10 / QJTC10 / I STXD1 / BE1out | I/O      | RTS2#       | RS232C #2                   | O   | -         | O                   | H                       |                                  |
|        | 4 | 33 TA2out / V/I NPC11 / QJTC11 / I SQ K1                                | I/O      | BZZER       | Buzzer                      | O   | P.U       | O                   | I                       | Buzzer                           |
|        | 5 | 32 TA2i n/ V/I NPC12 / QJTC12 / I SRXD1 / BE1i n                        | I/O      | BK_ON       | LOD BackLight_LED On        | O   | -         | O                   | I                       |                                  |
|        | 6 | 31 TA3out / CANOut / QJTC13 / I NPC13 / I STXD0                         | I/O      | LOD_RST#    | LOD Reset                   | O   | -         | O                   | H                       | Display Control                  |
|        | 7 | 30 TA3i n/ CANI n/ QJTC14 / I NPC14 / I SQ K0                           | I/O      | EBDY        | Flash Memory Ready          | I   | P.U       | I                   | I                       |                                  |
| P8     | 0 | 29 TA4out / I/I I SRXD0   | I/O      | WIND_ON     | Winding Motor On            | O   | P.D       | O                   | I                       | Winding Motor                    |
|        | 1 | 28 TA4i n/ I/I QJTC15 / I NPC15   | I/O      | (NET_RST#)  | Net (LAN) Reset             | O   | -         | O                   | H                       |                                  |
|        | 2 | 27 I NT0# / CANOut  | I/O      | PE#         | Power Fail Signal           | I   | -         | I                   | H                       | PE                               |
|        | 3 | 26 I NT1# / CANI n  | I/O      | (NET_INT#)  | LRC Interrupt               | I   | -         | I                   | (H)                     |                                  |
|        | 4 | 25 I NT2#   | I/O      | (G.B_INT#)  | GA Interrupt                | I   | -         | I                   | (H)                     | CPU Control Signal for RTC       |
|        | 5 | 24 NM#  | I        | N.C (NM)    | Fixed High                  | (I) | P.U       | I                   | (H)                     |                                  |
|        | 6 | 18 Xc0ut  | I/O      | Xc0ut       | Crystal 32.768kHz           | O   | -         | O                   | O                       |                                  |
|        | 7 | 17 Xci n  | I/O      | Xci n       | Crystal 32.768kHz           | I   | -         | I                   | I                       |                                  |

|     |     |           |                              |            |                           |                             |     |     |     |   |     |     |                                 |
|-----|-----|-----------|------------------------------|------------|---------------------------|-----------------------------|-----|-----|-----|---|-----|-----|---------------------------------|
| P9  | 0   | 7         | TB0i n/CLK3                  | I/O        | HCLK                      | Printer Head Clock          | O   | -   | O   | I | O   | I   | Printer Control                 |
|     | 1   | 6         | TB1i n/RXD3/SQ3/STXD3        | I/O        | HATCH#                    | Printer Head Latch          | O   | -   | O   | H | O   | I   |                                 |
|     | 2   | 5         | TB2i n/TXD3/SDA3/SRXD3       | I/O        | DATA                      | Printer Head Data           | O   | -   | O   | I | O   | I   |                                 |
|     | 3   | 4         | DA0/TB3i n/CTS3#/RTS3#/SS3#  | I/O        | HPSW                      | Printer Power On            | O   | P.D | O   | I | O   | I   |                                 |
|     | 4   | 3         | DA1/TB4i n/CTS4#/RTS4#/SS4#  | I/O        | RTS1#                     | RS232C #1                   | O   | -   | O   | H | O   | I   |                                 |
|     | 5   | 2         | ANEX0/CLK4                   | I/O        | CTS1#                     | RS232C #1                   | I   | P.D | I   |   |     | (I) |                                 |
|     | 6   | 1         | ANEX1/TXD4/SDA4/SRXD4        | I/O        | TxD1                      | RS232C #1                   | O   | -   | O   | I | O   | I   |                                 |
| P10 | 7   | 144       | ADrg# /RXD4/SQ4/STXD4        | I/O        | RxD1                      | RS232C #1                   | I   | P.D | I   |   |     | (I) | RS232C #1,<br>Program Down Load |
|     | 0   | 141       | AND                          | I/O        | SHMP                      | Thermal Head Power          | AI  | -   | I   |   |     |     |                                 |
|     | 1   | 139       | ANI                          | I/O        | SVBT                      | Back Up Battery Sense       | AI  |     | I   |   |     |     |                                 |
|     | 2   | 138       | AN2                          | I/O        | R_SHTH                    | TH Temp_R                   | AI  | p.u | I   |   |     |     |                                 |
|     | 3   | 137       | AN3                          | I/O        | J_SHTH                    | TH Temp_J                   | AI  | p.u | I   |   |     |     |                                 |
|     | 4   | 136       | AN4/K10#                     | I/O        | R_PEND                    | Paper End_R                 | I   | p.u | I   | H | I   |     |                                 |
|     | 5   | 135       | AN5/K11#                     | I/O        | J_PEND                    | Paper End_J                 | I   | p.u | I   | H | I   |     |                                 |
| P11 | 6   | 134       | AN6/K12#                     | I/O        | R_HDUP                    | Head Up_R                   | I   | p.u | I   | H | I   |     | Printer Paper                   |
|     | 7   | 133       | AN7/K13#                     | I/O        | J_HDUP                    | Head Up_J                   | I   | p.u | I   | H | I   |     |                                 |
|     | 0   | 118       | INPC10/OUTC10/I STXD1/BE1out | I/O        | DBWON                     | Drawer On/Gff               | O   | P.D | O   | I | O   | I   |                                 |
|     | 1   | 117       | INPC11/OUTC11/I SQK1         | I/O        | DBWSEN                    | Drawer Sensor               | I   | -   | I   | H | I   | I   |                                 |
|     | 2   | 116       | INPC12/OUTC12/I SRXD1/BE1in  | I/O        | BORON                     | BOR Power On                | O   | -   | O   | I | O   | I   |                                 |
|     | 3   | 115       | INPC13/OUTC13                | I/O        | CHGON                     | Back Up Battery             | O   | P.D | O   | H | O   | I   |                                 |
|     | 4   | 114       |                              | I/O        | VSDEN                     | SD_Vsd Power On             | O   | P.D | O   | H | O   | I   |                                 |
| P12 | 0   | 90        |                              | I/O        | KR0                       | Key Return 0                | I   | p.u | I   |   | O   | I   | Drawer Control                  |
|     | 1   | 89        |                              | I/O        | KR1                       | Key Return 1                | I   | p.u | I   |   | O   | I   |                                 |
|     | 2   | 88        |                              | I/O        | KR2                       | Key Return 2                | I   | p.u | I   |   | O   | I   |                                 |
|     | 3   | 87        |                              | I/O        | KR3                       | Key Return 3                | I   | p.u | I   |   | O   | I   |                                 |
|     | 4   | 86        |                              | I/O        | KR4                       | Key Return 4                | I   | p.u | I   |   | O   | I   |                                 |
|     | 5   | 68        |                              | I/O        | KR5                       | Key Return 5                | I   | p.u | I   |   | O   | I   |                                 |
|     | 6   | 67        |                              | I/O        | KR6                       | Key Return 6                | I   | p.u | I   |   | O   | I   |                                 |
| P13 | 7   | 66        |                              | I/O        | KR7                       | Key Return 7                | I   | p.u | I   |   | O   | I   | Printer Head                    |
|     | 0   | 61        |                              | I/O        | KS0                       | Key Scan 0                  | O   | p.u | O   | I | O   | I   |                                 |
|     | 1   | 60        |                              | I/O        | KS1                       | Key Scan 1                  | O   | p.u | O   | I | O   | I   |                                 |
|     | 2   | 58        |                              | I/O        | KS2                       | Key Scan 2                  | O   | p.u | O   | I | O   | I   |                                 |
|     | 3   | 56        |                              | I/O        | KS3                       | Key Scan 3                  | O   | p.u | O   | I | O   | I   |                                 |
|     | 4   | 51        |                              | I/O        | KS4                       | Key Scan 4                  | O   | p.u | O   | I | O   | I   |                                 |
|     | 5   | 50        |                              | I/O        | KS5                       | Key Scan 5                  | O   | p.u | O   | I | O   | I   |                                 |
| P14 | 6   | 49        |                              | I/O        | KS6                       | Key Scan 6                  | O   | p.u | O   | I | O   | I   | Key return                      |
|     | 7   | 48        |                              | I/O        | KS7                       | Key Scan 7                  | O   | p.u | O   | I | O   | I   |                                 |
|     | 0   | 14        | INPC14/OUTC14                | I/O        | KR8                       | Key Return 8                | I   | p.u | I   |   | O   | I   |                                 |
|     | 1   | 13        | INPC15/OUTC15                | I/O        | KR9                       | Key Return 9                | I   | p.u | I   |   | O   | I   |                                 |
|     | 2   | 12        | INPC16/OUTC16                | I/O        | KR10                      | Key Return 10               | I   | p.u | I   |   | O   | I   |                                 |
|     | 3   | 11        | INPC17/OUTC17                | I/O        | KR11                      | Key Return 11               | I   | p.u | I   |   | O   | I   |                                 |
|     | 4   | 10        |                              | I/O        | (KR12)                    | (Key Return 12)             | I   | p.u | I   |   | O   | I   |                                 |
| P15 | 5   | 9         |                              | I/O        | (KR13)                    | (Key Return 13)             | I   | p.u | I   |   | O   | I   | Key return                      |
|     | 6   | 8         |                              | I/O        | CTL RTN                   | Control Lock Return         | I   | p.u | I   |   | O   | I   |                                 |
|     | 0   | 131       | ANI50/I STXD0                | I/O        | PH1                       | Motor PH1                   | O   | -   | O   |   | O   | I   |                                 |
|     | 1   | 129       | ANI51/I SQK0                 | I/O        | PH2                       | Motor PH2                   | O   | -   | O   |   | O   | I   |                                 |
|     | 2   | 128       | ANI52/I SRXD0                | I/O        | PH3                       | Motor PH3                   | O   | -   | O   |   | O   | I   |                                 |
|     | 3   | 127       | ANI53                        | I/O        | PH4                       | Motor PH4                   | O   | -   | O   |   | O   | I   |                                 |
|     | 4   | 126       | ANI54                        | I/O        | R_SEL                     | R MOTOR SELECT              | O   | p.u | O   | H | O   | I   |                                 |
| P16 | 5   | 125       | ANI55                        | I/O        | J_SEL                     | J MOTOR SELECT              | O   | p.u | O   | H | O   | I   | Motor Select                    |
|     | 6   | 124       | ANI56                        | I/O        | C_SEL                     | C MOTOR SELECT              | O   | p.u | O   | H | O   | I   |                                 |
|     | 7   | 123       | ANI57                        | I/O        | C_SEN                     | CUTTER SENSOR               | I   | p.u | I   | H | I   | I   |                                 |
|     | 15  | BYTE (*1) | I                            | P.U        | P.U(H): 8bit Data Bus     | I                           | P.U | I   | (H) | I | (H) |     |                                 |
|     | 16  | OVSS (*2) | I                            | EMP OVSS   | P.D(Vss): Mem Ext Mode    | I                           | P.D | I   | (I) | I | (I) |     |                                 |
|     | 19  | RESET#    | I                            | CE1 RESET# | RESET                     | I                           | P.U | I   |     |   |     |     |                                 |
|     | 20  | Xout      | O                            | CR pin     | Ceramic Resonator 9.83MHz | O                           |     |     |     |   |     |     |                                 |
| P17 | 21  | Vss       | I                            | Power      | GND                       | Ground(0V)                  | I   |     |     |   |     |     | for Flash CPU                   |
|     | 22  | Xin       | I                            | Power      | CR pin                    | Ceramic Resonator 9.83MHz   | I   |     |     |   |     |     |                                 |
|     | 23  | Vcc1      | I                            | Power      | VBB                       | P.ON +3.3V/BackUp: +3.3V_3V | I   |     |     |   |     |     |                                 |
|     | 39  | Vcc1      | I                            | Power      | VBB                       | P.ON +3.3V/BackUp: +3.3V_3V | I   |     |     |   |     |     |                                 |
|     | 41  | Vss       | I                            | Power      | GND                       | Ground(0V)                  | I   |     |     |   |     |     |                                 |
|     | 57  | Vss       | I                            | Power      | GND                       | Ground(0V)                  | I   |     |     |   |     |     |                                 |
|     | 59  | Vcc2      | I                            | Power      | VBB                       | P.ON +3.3V/BackUp: +3.3V_3V | I   |     |     |   |     |     |                                 |
|     | 74  | Vcc2      | I                            | Power      | VBB                       | P.ON +3.3V/BackUp: +3.3V_3V | I   |     |     |   |     |     |                                 |
|     | 76  | Vss       | I                            | Power      | GND                       | Ground(0V)                  | I   |     |     |   |     |     |                                 |
|     | 91  | Vcc2      | I                            | Power      | VBB                       | P.ON +3.3V/BackUp: +3.3V_3V | I   |     |     |   |     |     |                                 |
|     | 93  | Vss       | I                            | Power      | GND                       | Ground(0V)                  | I   |     |     |   |     |     |                                 |
|     | 130 | Vss       | I                            | Power      | GND                       | Ground(0V)                  | I   |     |     |   |     |     |                                 |
|     | 132 | Vcc1      | I                            | Power      | VBB                       | P.ON +3.3V/BackUp: +3.3V_3V | I   |     |     |   |     |     |                                 |
|     | 140 | Avss      | I                            | Power      | GND                       | Ground(0V)                  | I   |     |     |   |     |     |                                 |
|     | 142 | Vref      | I                            | Power      | VBB                       | P.ON +3.3V/BackUp: +3.3V_3V | I   |     |     |   |     |     |                                 |
|     | 143 | Avcc      | I                            | Power      | VBB                       | P.ON +3.3V/BackUp: +3.3V_3V | I   |     |     |   |     |     |                                 |

O.D.: Open Drain output  
 Power: Power supply input  
 P.U.: Pull up (VBB)  
 p.u.: Pull up (VCC)  
 P.D.: Pull down (GND)

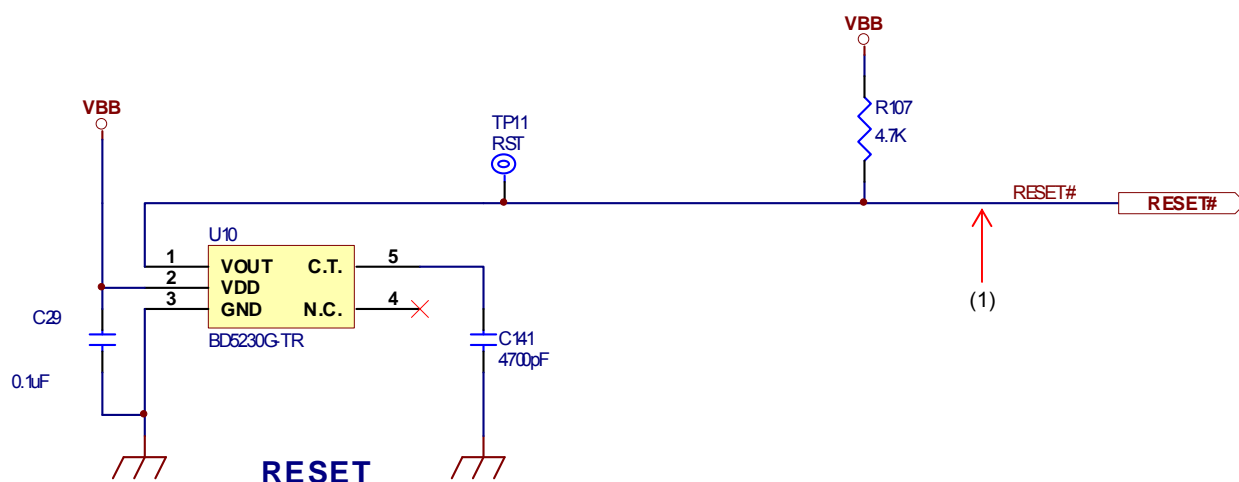


### 3-4. RESET CIRCUIT

The reset circuit prevents the CPU from starting to operate before the system is fully powered-up and initialized. Then 29m sec. after power is applied, reset goes high and the CPU can begin functioning.

When power is first applied to the circuit, the VBB begins charging C141 a capacitor.

Output of Reset IC(U10) is low-resistance at VBB-Line is less than 3.0 Volts.



### Trouble shooting

#### - When power ON but no display / any key operation unable.

Check the voltage at point (1)

DC +3.3V - - - Reset circuit is OK. The problem may come from other causes.

Check the Power supply circuit again and replace Main board  
if no problem found in the power supply circuit.

0V - - - Reset circuit has a problem. Replace Main board.

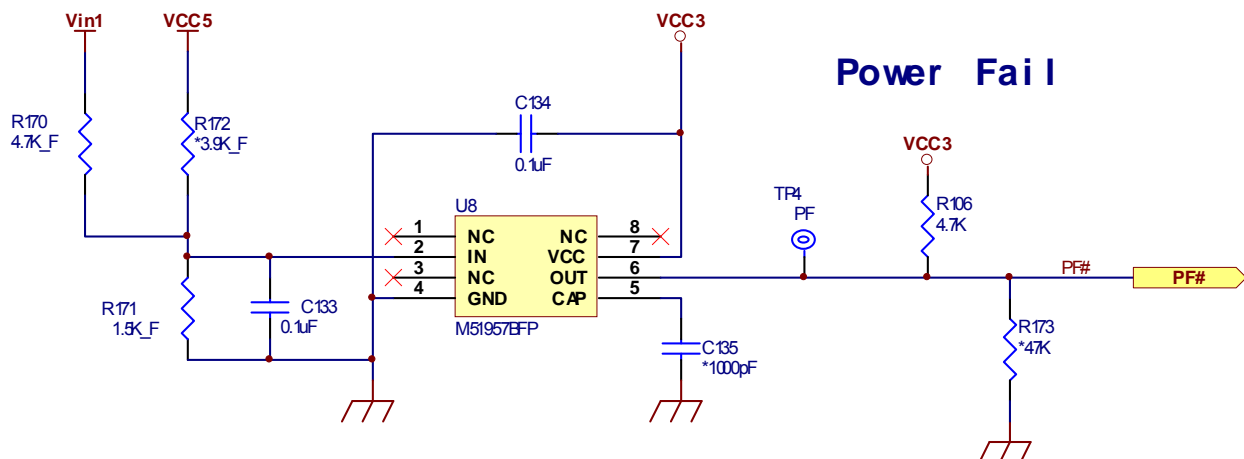
### 3-5. POWER FAIL CIRCUIT

Power fail generated by a circuit using the PF DTC voltage.

When power is on and the system is operating normally, the power fail signal stays at a higher voltage than 1.21V.

The CPU watches power failure signals all the time. When power is on, PF -5pin at High level.

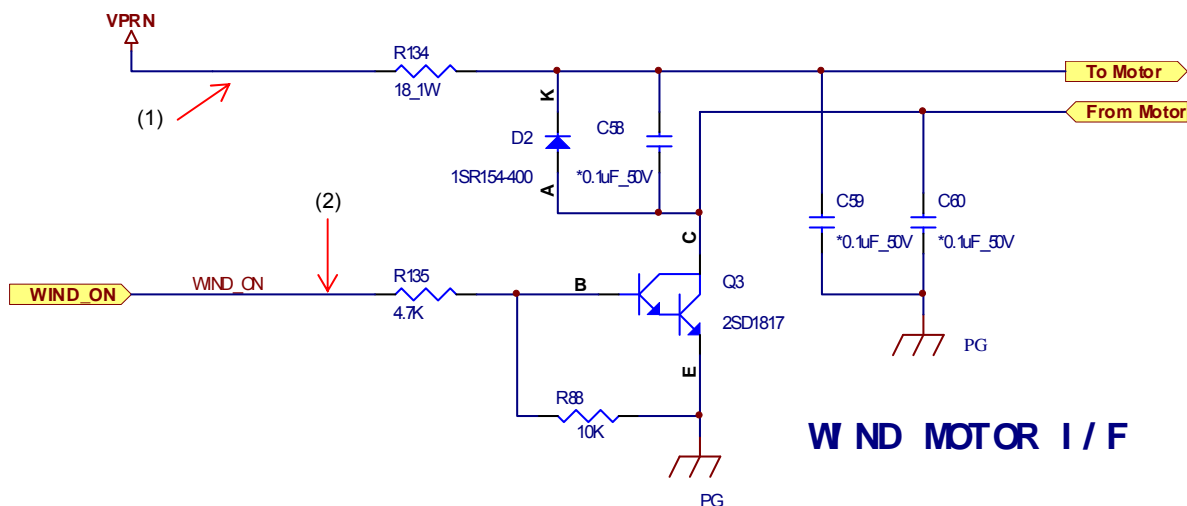
When power down and CPU(U1)27pin voltage goes down lower than PF detection voltage(=1.21V), low-power-supply detector circuit of the CPU works and execute PF.



### 3-6. WINDING MOTOR CIRCUIT

The winding motor power is VPRN at Printer Power voltage.

Printer Power voltage is on, and WIND\_ON is Hi, when Q3 is ON as the winding motor is run.



## **Trouble shooting**

**- Start up the Diagnostic software and check whether winding motor is properly working or not.**

- - -See 4-1. DIAGNOSTIC SOFTWARE

CHECK

**- If Winding motor does not work, start up Diagnostic software again and check the following voltage when the test report is printing on a receipt.**

Note)

When a printer is not working, the power supply of the winding motor should be OFF status / 0V.

Therefore make sure the following voltage should be checked during the printing in the diagnostic checking.

Check voltage (DC +7.6V) at point (1)

If it output properly - - - Replace the motor

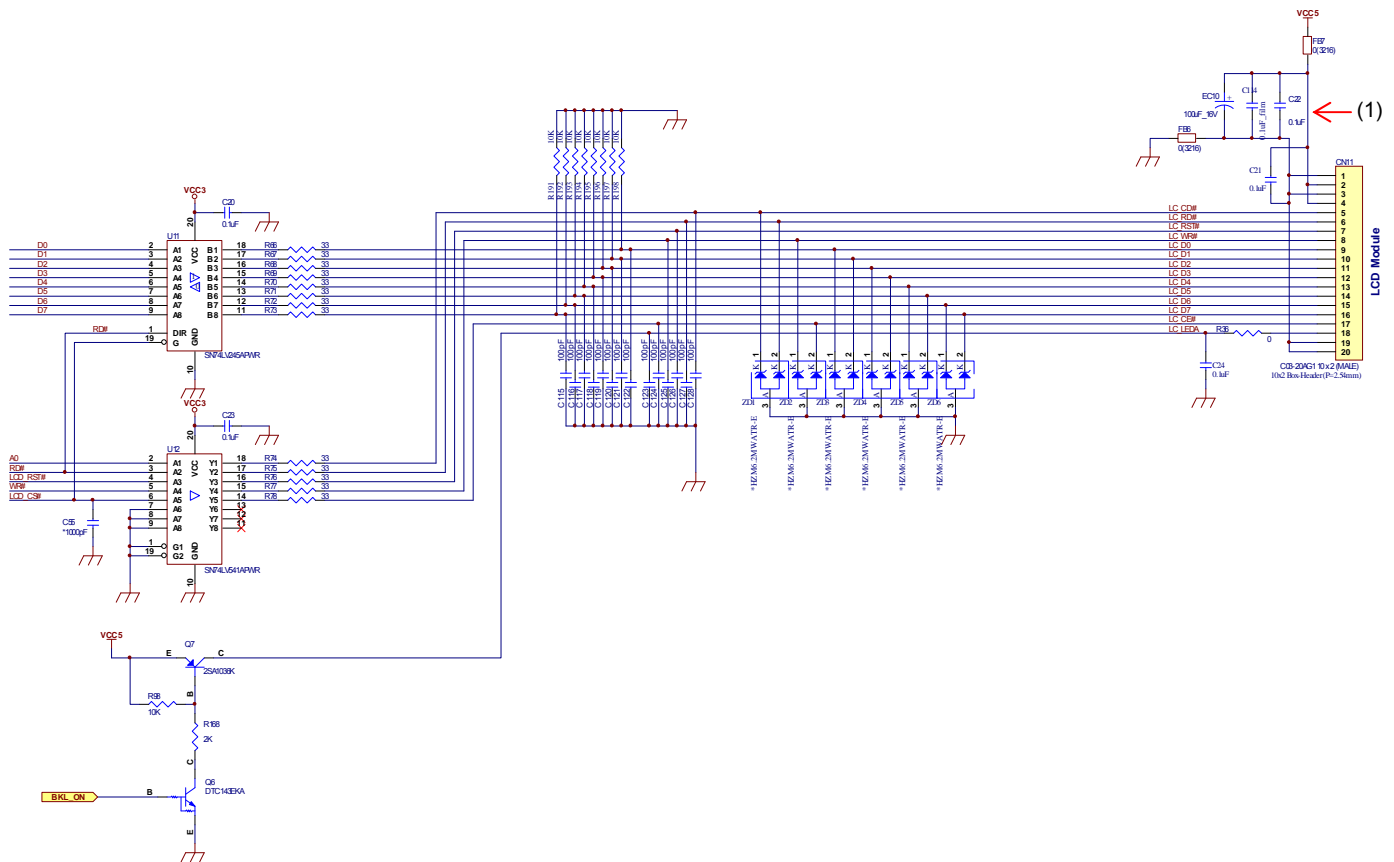
If it does not output properly - - - Check Power supply circuit (p. 9-11)

Check voltage (DC +5.0V) at point (2)

If it output properly - - - Replace the motor or Main board

If it does not output properly - - - Replace the Main Board

### 3-7. DISPLAY CIRCUIT



### Trouble shooting

- No display but backlight turns on - - Replace LCD unit or Main board.

- Display OK, but backlight does not turn on.

Check voltage at point (2)

DC +5V - - - Replace LCD unit.

DC 0V - - - Replace Main board.

- No display and no backlight. <sup>(2)</sup>  
↓

Check voltage at point (1)

DC +5V - - - Replace LCD unit or Main board.

DC 0V - - - Check Power supply circuit. (P.9-11)



### 3-8. DISPLAY INFORMATION

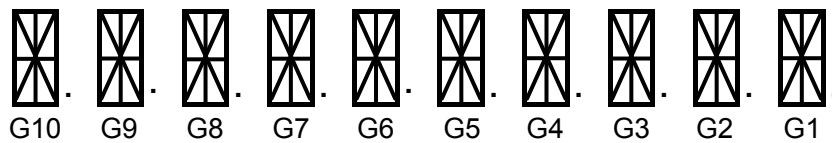
#### Front Display

LCD (160 x 80 dots)      Part No.: GY1608A8SKY6T

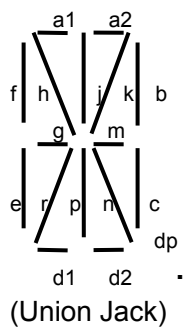
Refer to the specification (attached).

#### Rear Display

VFD (16 segments)      Part No.: 10LY-01G



#### Segment



Character size : 14 mm (H) x 4.9 mm (W)

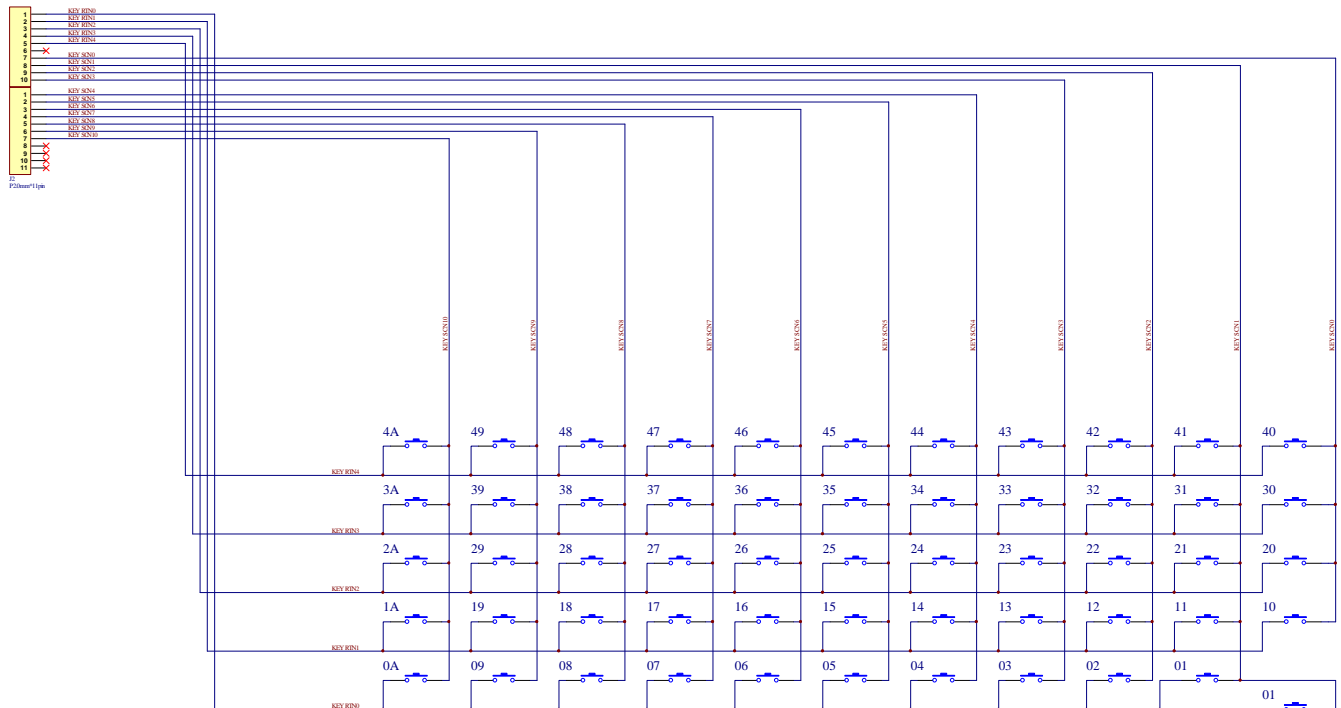
### 3-9. KEYBOARD CIRCUIT

Keyboard Scan lines are the CPU ports, these CPU ports are P120-126 and P130-137.

Keyboard Return lines are the CPU ports, these CPU ports are P140-145.

It is consist of matrix of Scan line (15) × Return line (6).

#### KEY MATRIX



#### KEY LAYOUT

|    |    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|----|
| 4A | 49 | 48 | 47 | 46 | 45 | 44 | 43 | 42 | 41 | 40 |
| 3A | 39 | 38 | 37 | 36 | 35 | 34 | 33 | 32 | 31 | 30 |
| 2A | 29 | 28 | 27 | 26 | 25 | 24 | 23 | 22 | 21 | 20 |
| 1A | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 |
| 0A | 09 | 08 | 07 | 06 | 05 | 04 | 03 | 02 | 01 | 01 |

#### Trouble shooting

- All keys do not work at all. - - - Replace Main board.

- Only a specific key does not work.

Check the lead wire.

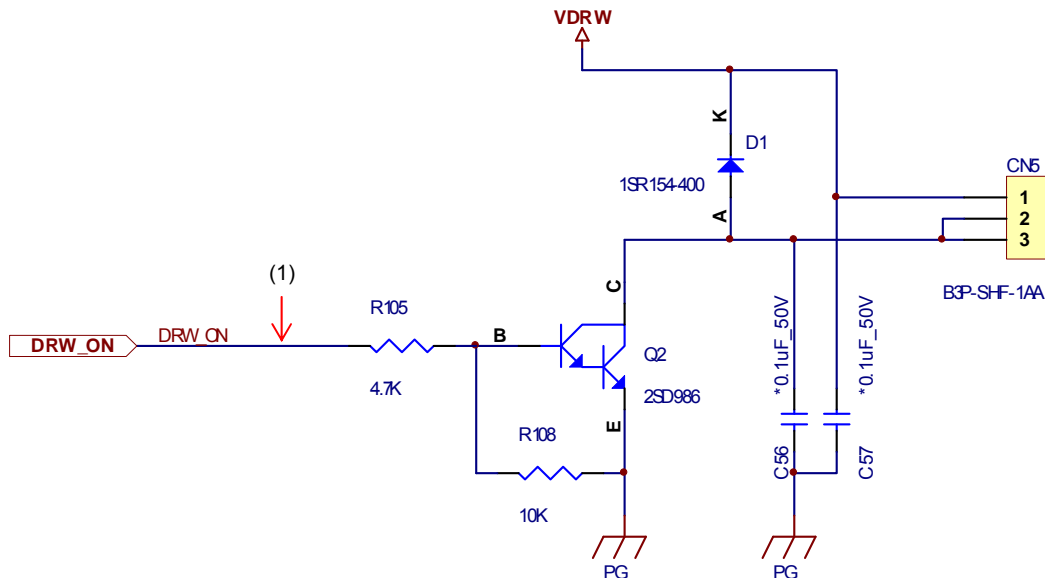
Lead wire is broken - - - Replace Lead wire.

Lead wire is not broken - - - Replace K/B unit.

When it's not broken, replace K/B unit.

### 3-10. DRAWER CIRCUIT

The solenoid for a drawer is activated using the signal P110 from the CPU. This signal is normally Low, and goes High to cause the drawer to run. When P110 is High, Q2 is on. Current flow through the transistor cause the collector to be held Low, near grand potential.



#### Trouble shooting

**- Drawer remains opened. (Drawer does not close.)**

Check the voltage at point (1)

DC +3.3V - - - Replace Main board.

0V - - - Replace the Drawer unit.

**- Drawer remains closed. (Drawer does not open)**

Check whether or not the drawer opens by emergency lever.

If drawer opens - - - It should not be considered a mechanic problem.

Check the voltage at point (1)

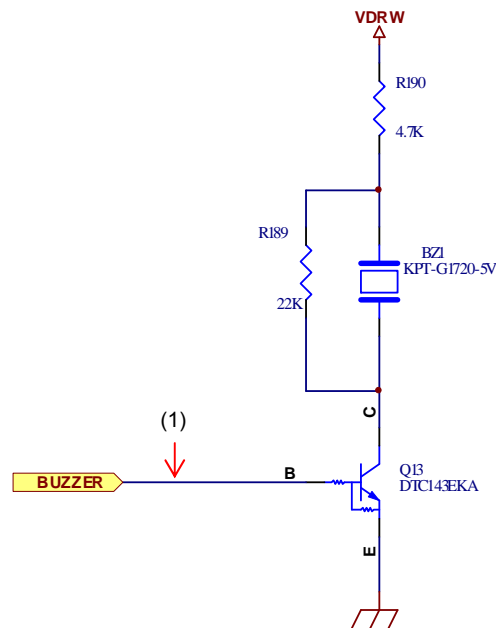
If drawer does not open - - - It should be considered a mechanic problem.

Replace the drawer unit.



### 3-11. BUZZER CIRCUIT

The buzzer circuit uses as its input signal P74 from the CPU. This normally Low signal and goes High on 2 conditions. First on an error tone, P74 goes Clocked until the error condition is cleared. For a key beep tone, P74 goes High and then returns to its Low state. This pulse is of extremely short duration.



#### Trouble shooting

**- No buzzer sound when [clear] key is depressed.**

Check the voltage at point (1)

DC +24V - - - Replace Main board.

0V - - - Check Power supply circuit. (P.9-11)

## 3-12. BATTERY CIRCUIT

VBB voltage is used by CPU, external RAM and FROM.  
It is supplied by dry battery at the time of back-up.

Battery specification

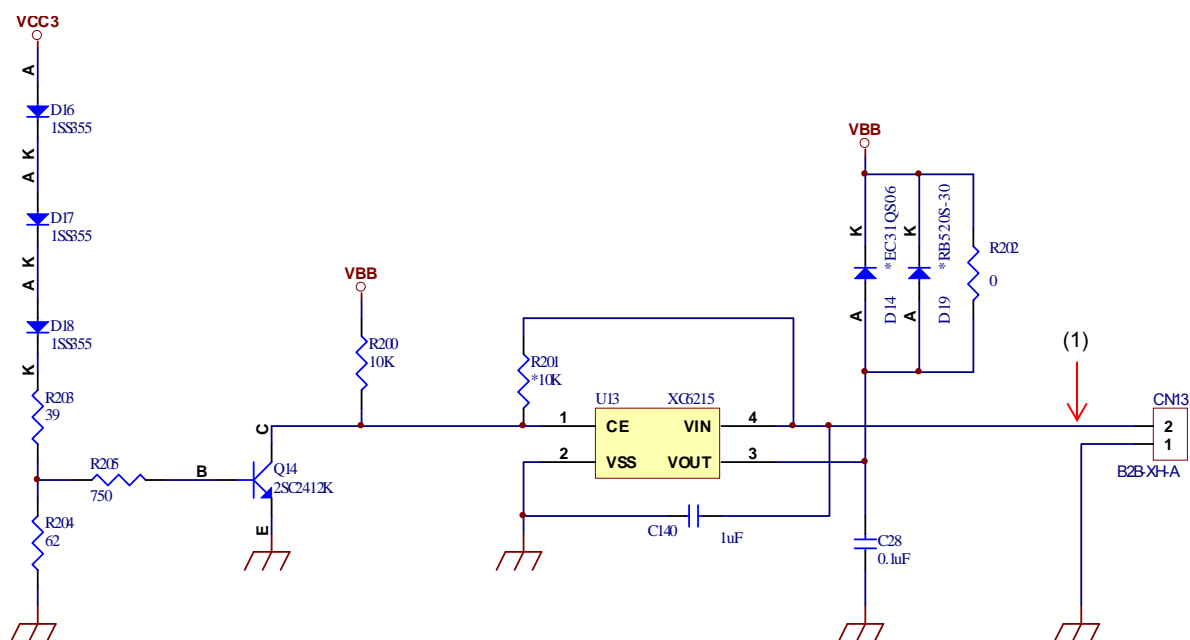
Type : AA x 3pcs

Voltage: 4.5V

### CAUTION;

**RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.**

**DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.**



### Trouble shooting

- Check whether the batteries are supplied in the battery box.
- Check the voltage of each battery. (It should be over 1.1V per battery.)
  - It outputs less than 1.1V per battery (less than 3.3V with 3 batteries) - - - Replace the battery.
  - It outputs over 1.1V per battery (over 3.3V with 3 batteries). - - - Check the voltage at point (1).
- Check the voltage at point (1)
  - It outputs almost same voltage as battery voltage - - - Replace Main Board.
  - It outputs much less than the battery voltage or 0V - - - Replace Battery unit.



### 3-13. EXTERNAL MEMORY

#### 3-13-1. SRAM (BS62LV4006SCP-70)

512K bytes S-RAM used as an external RAM for PLU and Electric Journal and etc.

P00 through P07 are multiplex bus that consists of data bus (D0-D7).

P20 through P27 are multiplex bus that consists of data bus (A0-A7).

P30 through P37 are multiplex bus that consists of data bus (A8-A15).

P40 is multiplex bus that consists of data bus (A16).

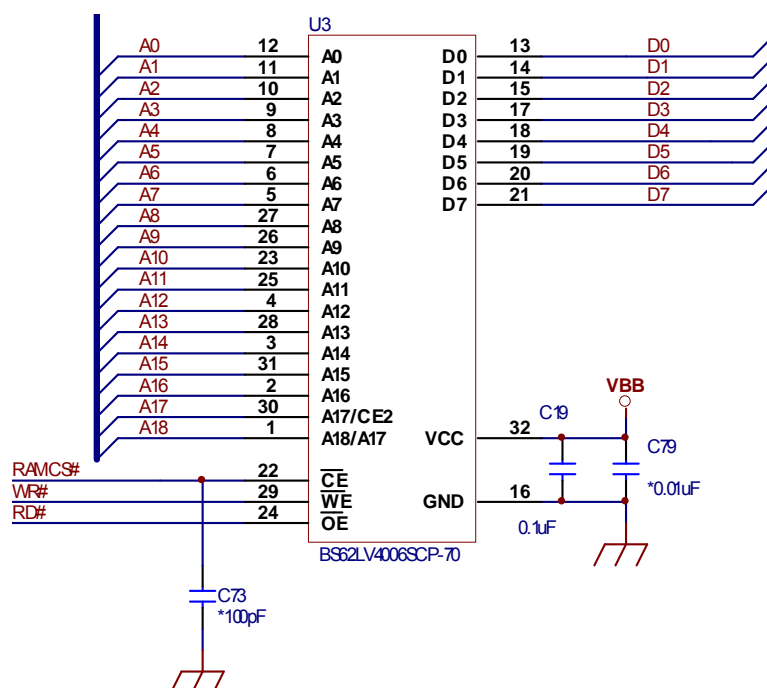
P41 is multiplex bus that consists of data bus (A17).

P42 is multiplex bus that consists of data bus (A18).

P45 is used for chip select at RAM.

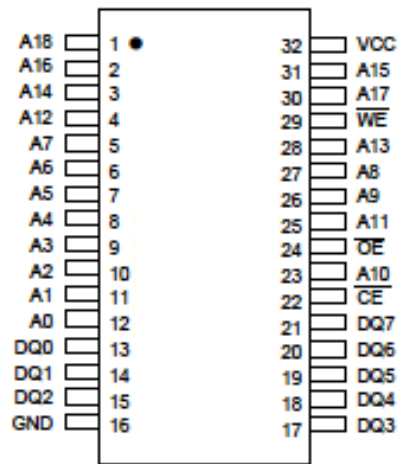
P52 is used for Output Enable, P50 is used for Write Enable control.

#### EXTERNAL MEMORY CIRCUIT



## S-RAM PIN Configuration

Refer to the specification. (attached data sheet)

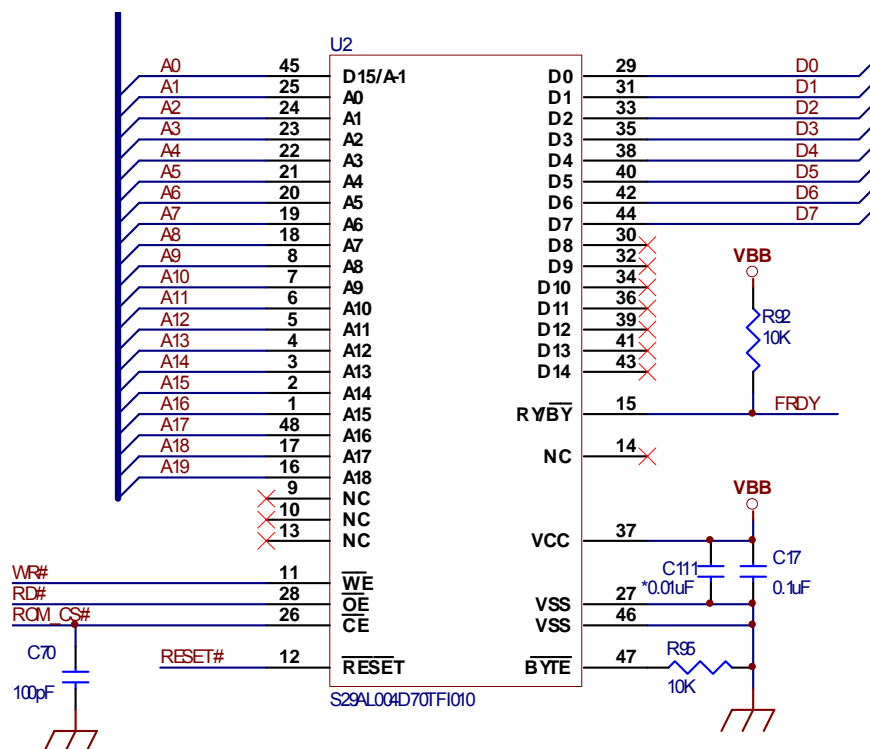


### 3-13-2. FROM (S29AL004D70TFI010)

512K bytes FROM is used as programming.

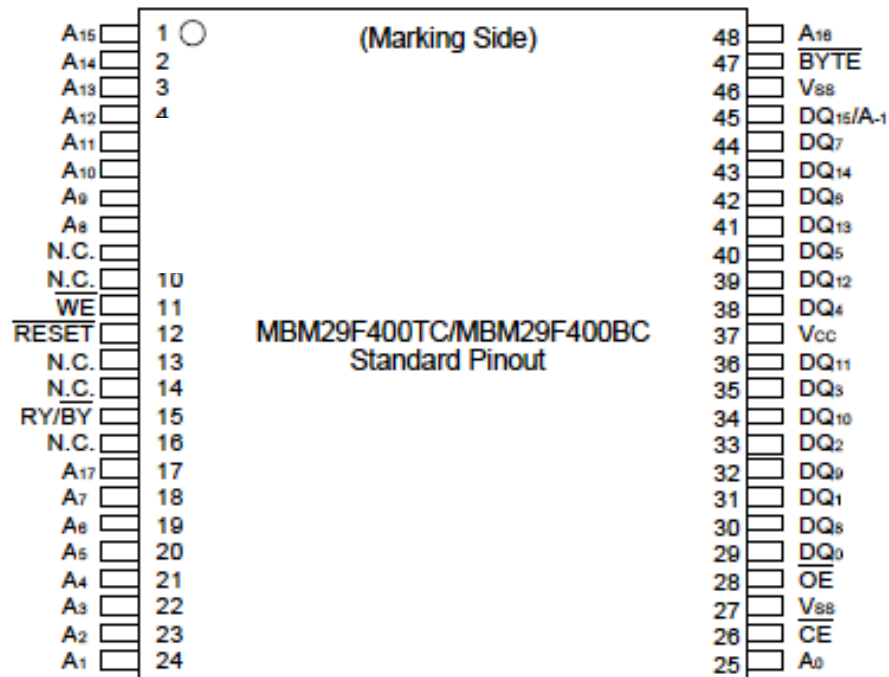
P00 through P07 are multiplex bus that consists of data bus (D0-D7).  
P20 through P27 are multiplex bus that consists of data bus (A0-A7).  
P30 through P37 are multiplex bus that consists of data bus (A8-A15).  
P40 is multiplex bus that consists of data bus (A16).  
P41 is multiplex bus that consists of data bus (A17).  
P42 is multiplex bus that consists of data bus (A18)  
P43 is multiplex bus that consists of data bus (A19)  
P47 is used for chip select at RAM.  
P52 is used for Output Enable, P50 is used for Write Enable control.

#### EXTERNAL MEMORY CIRCUIT



## FROM PIN Configuration

Refer to the specification. (attached data sheet)







### 3-14. PRINTER CIRCUIT

#### Thermal Head

The thermal head of the printer consists of heat elements, and head drivers to drive the heat elements.

Serial printing data input from the DAT IN pin is transferred to the shift register synchronously with the CLK signal, then stored in the latch register with the timing of the LATCH signal.

Inputting the head activation signal activates heat elements in accordance with the printing data stored in the latch register.

Each 144-dot block for LTPC235 are printed.

#### Sensor

This printer has Head-up sensor and Paper-end sensor.

Both signals normally outputs Low, but it out puts High when Head-up or Paper-end.

This High signal goes through Nor-gate and changed Low, then it is input into CPU (U1).

#### Excitation Sequence

As shown in Table 3-14-1, the printer feeds paper in the normal direction when the motor is excited in the order of step 1, step 2, step 3, step 4 step 1, step 2, ....by inputting the voltage signals in Figure 3-14-1.

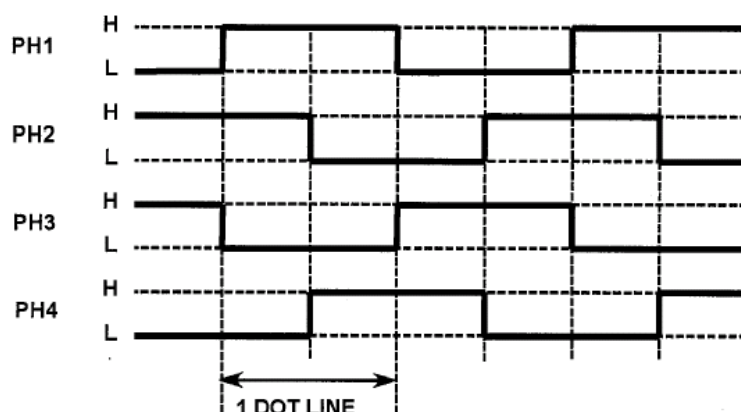


Figure 3-14-1. Input Voltage Signals for the Sample Drive Circuit

|        | Input signal |      |      |      | Output signal  |   |   |                |
|--------|--------------|------|------|------|----------------|---|---|----------------|
|        | PH 1         | PH 2 | PH 3 | PH 4 | $\overline{A}$ | B | A | $\overline{B}$ |
| Step 1 | L            | L    | H    | H    | H              | H | L | L              |
| Step 2 | L            | H    | H    | L    | H              | L | L | H              |
| Step 3 | H            | H    | L    | L    | L              | L | H | H              |
| Step 4 | H            | L    | L    | H    | L              | H | H | L              |

Table 3-14-1. Excitation Sequence

## Motor and Thermal Head drive timing

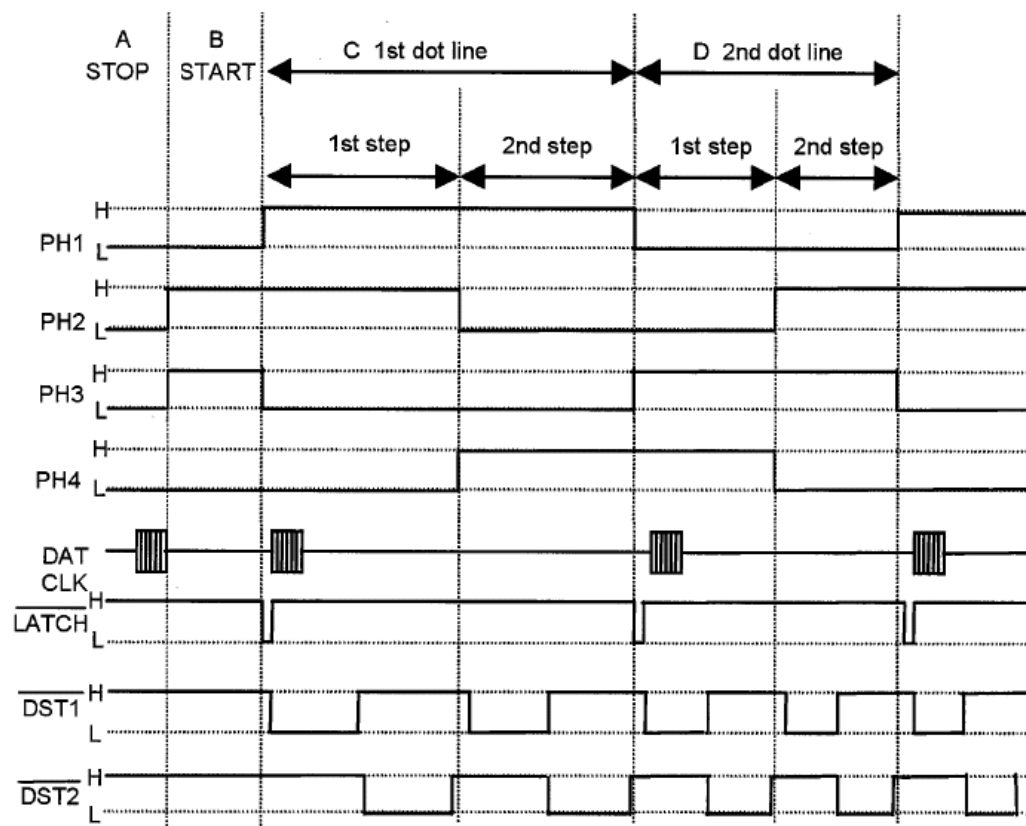
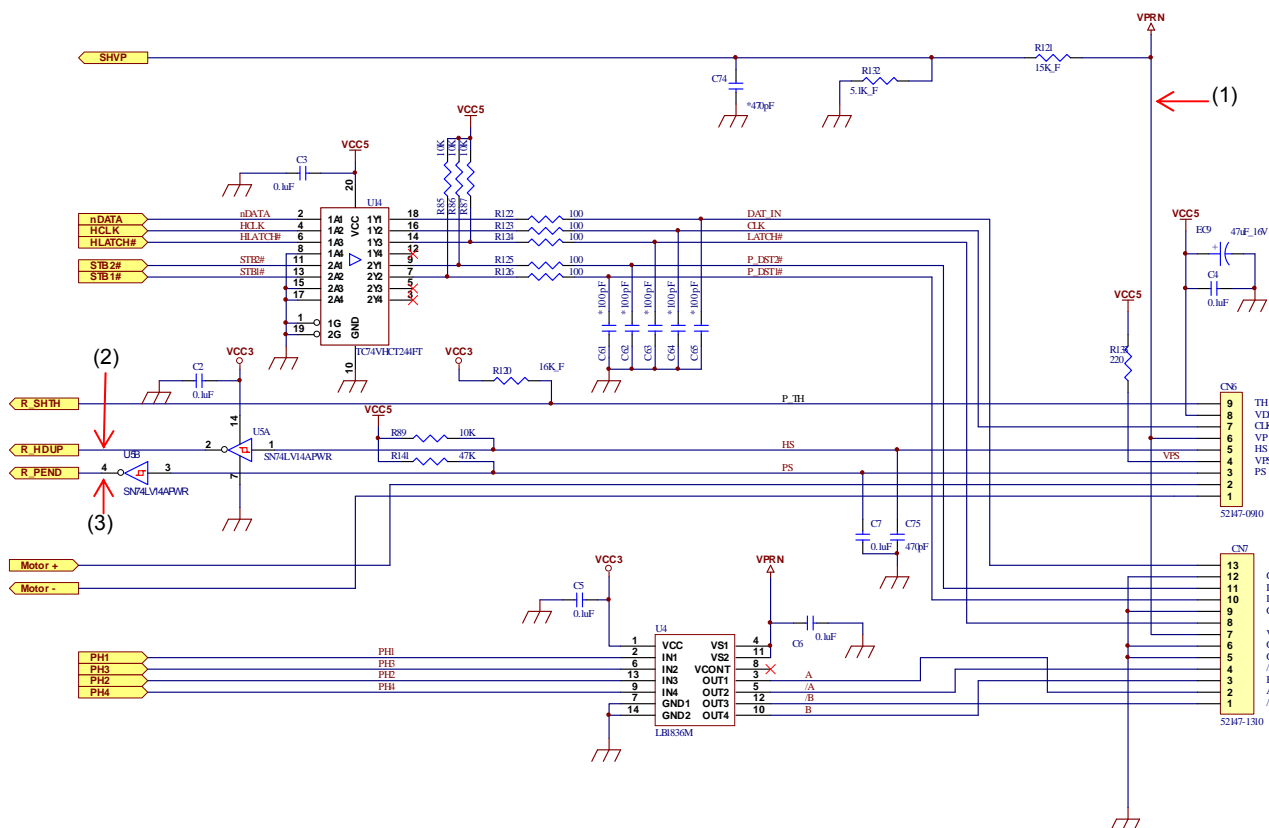


Figure 3-14-2. 2-Division Printing Timing Chart

## PRINTER CIRCUIT



## Trouble shooting

### - Cannot print, or cannot Feed paper.

Check voltage (AC +7.6V) at point (1).

If it outputs properly - - - Replace Main board or printer.

If it doesn't output properly - - - Check Power supply circuit. (P.9-11)

### - Faded print, or run print. - - - Replace Main board or printer.

### - Cannot cancel Head-up sensor error.

Check voltage at point (2).

If DC+5.0V is properly output - - - Replace Main Board.

If DC+5.0V is not properly output - - - Replace Printer.

### - Cannot cancel Paper-end sensor error.

Check voltage at point (3).

If DC+5.0V is properly output - - - Replace Main Board.

If DC+5.0V is not properly output - - - Replace Printer.

### - Head-up sensor or Paper-end sensor does not work. - - - Replace Main board and printer.

### 3-15. INTERFACE CIRCUIT

## BCR I/F

TXD2, RXD2, RTS2 and CTS2 are UART communication parts from the CPU (U1).

U7 (MAX3232CPWR) is RS232C transceiver.

The BCR power supply (+5V) is output by the BCR-ON signal from the CPU.

## USB I/F

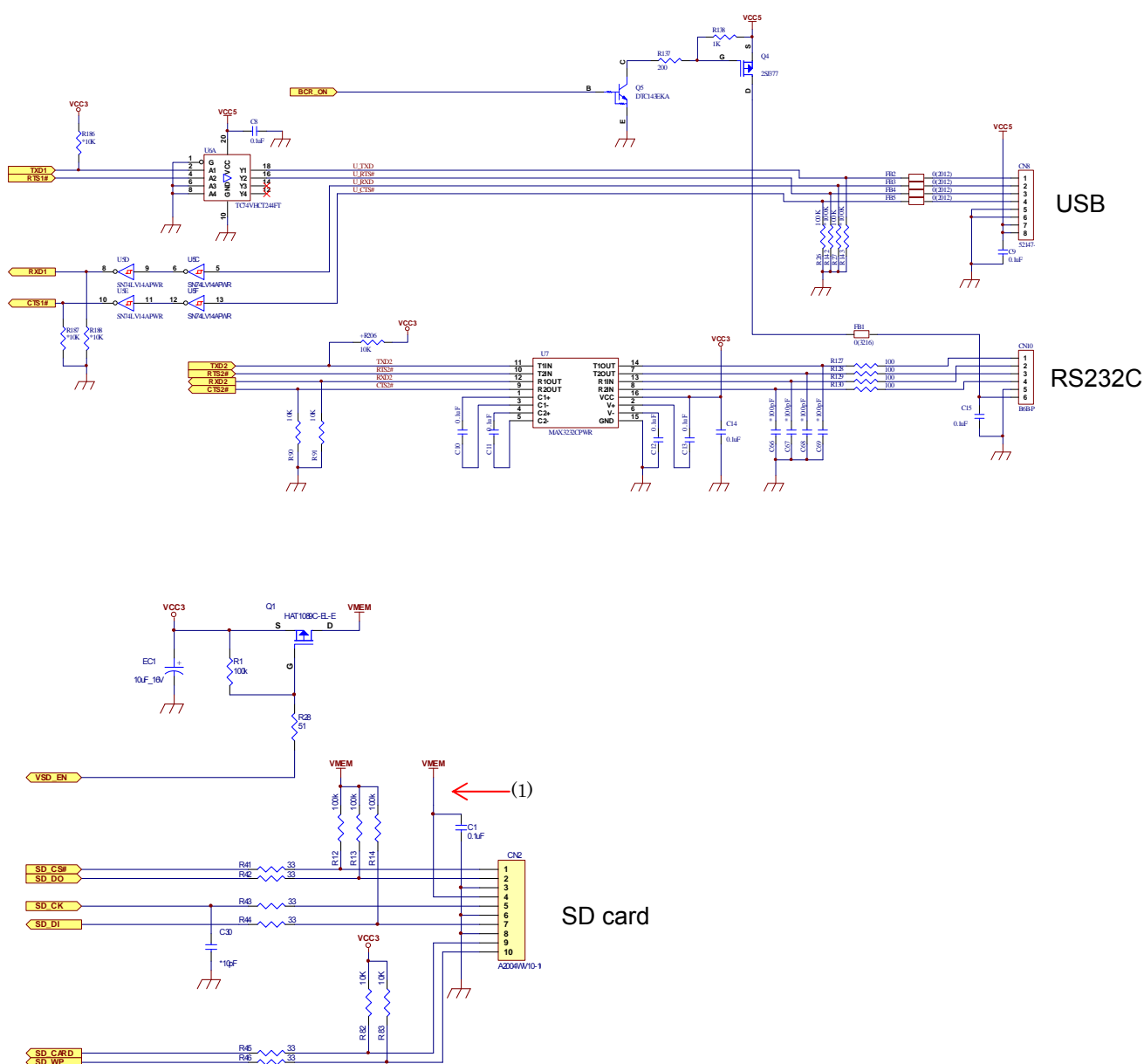
USB I/F is controlled by the M38K07M4L (U1).

The serial I/F is transferred to USB I/F in this circuit.

## SD card I/F

SD card I/F is controlled by the CPU (U1).

When the data is written/read, VSD\_EN goes High and VMEM is supplied to SD card.



## **Trouble shooting**

### **- Scanner head lamp does not light up when power ON.**

Check the voltage (AC +5.0V) at point (1).

If it outputs properly - - - Replace the Harness ass'y.

If it doesn't output properly - - - Replace the Main board.

### **- Scanner head lamp lights up but the scanner does not read a barcode.**

- - - Replace the Harness. If the condition is not changed, replace the Main board.

### **- Cannot work the USB port - - - Replace USB I/F Board.**

### **- Cannot write or read the data for SD card**

Check the voltage (DC +3.0V) at point (2).

If it outputs properly - - - Replace Main board or SD card unit.

If it doesn't output properly - - - Replace Main board.

## 4. DIAGNOSTIC SOFTWARE

#### 4-1. DIAGNOSTIC CHECK & FINISHED GOODS CHECK

Diagnostic Software will check whether the machine works properly or not. It is already built in the machine and is always ready to boot this software by the following instructions. It is also useful to check after repairing the machine.

Note)

Once you start up the diagnostic software, you should operate all the checkup items. In other words, it is impossible to check only Keyboard unit, Display unit, or Drawer unit etc. Please make sure you should complete the diagnostic software and it means OK when no error occurs through the checkup.

## DIAGNOSTIC CHECK LIST

[illegible]

[illegible]

[illegible]



[illegible]

After repairing the machine, go through the finished goods check list below. It means OK when no error occurs through the checkup.

## FINISHED GOODS CHECK LIST

[illegible]



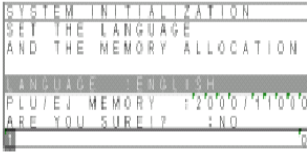

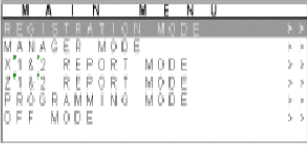


| MODE<br>(モード) | Steps Description (操作)  | LCD Display (LCD表示)   | VFD Display (VFD表示) | RECEIPT (レシート)   |
|---------------|---|---|---------------------|--|
|               | Print Check: (プリントチェック)   | <div> SYSTEM INITIALIZATION<br/> SET THE LANGUAGE<br/> AND THE MEMORY ALLOCATION<br/> <br/> LANGUAGE : ENGLISH<br/> PLU/EJ MEMORY : 2'0'0'0 / 1'1'0'0<br/> ARE YOU SURE? : NO<br/> 1 </div> |                     | ! " # \$ % & ' ( ) * + , - . / 0 1 2 3 4 5 6 7<br>8 9 : ; < = > ? @ A B C D E F G H I J K L M N O<br>P Q R S T U V W X Y Z [ \ ] ^ _ ` a b c d e f g<br>h i j k l m n o p q r s t u v w x y z {   } ~ ¯<br>¡ ¢ £ ¤ ¥ ¦ § ¨ © ª « ¬ ® ¯ ° ± ² ³ ´ µ ¶ · ¸ ¹ º » ¼ ½ ¾<br>À Á Â Ã Ä Å Æ Ç È É Ê Ë Ì Í Î Ï Ñ Ò Ó Ô Õ Ö × Ø Ù Ú Û Ü Ý Þ ß à á â ã<br>ä å æ ç è é ê ë ì í î ï ð ñ ò ó ô õ ö ÷ ø ù ú û ü ý þ ÿ |
|               | Connection test of USB<br>(USBの接続試験)  |   |                     |  |
|               | Press [↓]. (↓を押す)   |   |                     |  |
|               | Press [↓]. (↓を押す)   | <div> SYSTEM INITIALIZATION<br/> SET THE LANGUAGE<br/> AND THE MEMORY ALLOCATION<br/> <br/> LANGUAGE : ENGLISH<br/> PLU/EJ MEMORY : 2'0'0'0 / 1'1'0'0<br/> ARE YOU SURE? : NO<br/> 1 </div> |                     |  |
|               | Press [TOTAL]. (TOTALを押す)   | <div> MAIN MENU<br/> REGISTRATION MODE &gt; 8<br/> MANAGER MODE &gt; 9<br/> X'1'2 REPORT MODE &gt; 9<br/> X'1'2 REPORT MODE &gt; 9<br/> PROGRAMMING MODE &gt; 9<br/> OFF MODE &gt; 5 </div> |                     | <<< RESET A >>><br><<< RESET B >>>   |
|               | Only the connection first time<br>should install USB driver in PC.<br>Please install Win2kcom.inf<br>referring to appended USB DRIVER.DOC.<br>In OS, only WindowsXP or<br>Windows2000 is correspondence.<br>(初回接続のみPCIにUSBドライバを<br>インストールする必要があります。<br>添付されているUSB DRIVER.DOCを参照し、<br>Win2kcom.infをインストールして下さい。<br>OSはWindowsXP、又はWindows2000のみ<br>対応です) |   |                     |  |

## 4-2. SOFTWARE VERSION CHECK

Through the diagnostic check, it shows the software version in the beginning of the check. However, it is possible to check only the software version without diagnostic check.

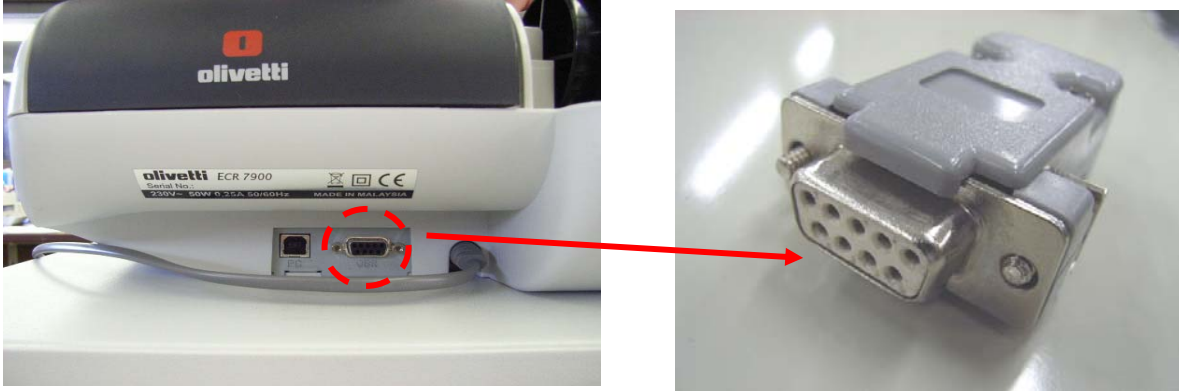
### SOFTWARE VERSION CHECK

| MODE<br>(モード) | Steps Description (操作)  | LCD Display (LCD表示)  | VFD Display (VFD表示) | RECEIPT (レシート)  |
|---------------|---|--|---------------------|---|
|               | Print Check: (プリントチェック)   |   |                     | <pre>!"#\$%&amp;'()*+,-./01234567 89:;&lt;=&gt;?@ABCDEFGHIJKLMNO PQRSTUVWXYZ[\]^_`abcdefg hijklmnopqrstuvwxyz{ }~ !TTTNNNNFFAAII0000000000 DP0123456789000000000000 NIP:SCBS09:SAE0000000000 05zzACELN0SZZAAAAGEEEEG IINCO00000000000000000000 0T 1T 2T</pre> |
|               | Connection test of USB<br>(USBの接続試験)<br>Press [↓]. ([↓]を押す)<br>Press [↓]. ([↓]を押す)  |   |                     |   |
|               | Press [TOTAL]. ([TOTAL]を押す)   |  |                     | <pre>&lt;&lt;&lt; RESET          A &gt;&gt;&gt; &lt;&lt;&lt; RESET          B &gt;&gt;&gt;</pre>  |
|               | Only the connection first time<br>should install USB driver in PC.<br>Please install Win2kcom.inf<br>referring to appended USB DRIVER.DOC.<br>In OS, only WindowsXP or<br>Windows2000 is correspondence.<br>(初回接続のみPCIにUSBドライバを<br>インストールする必要があります。<br>添付されているUSB DRIVER.DOCを参照し、<br>Win2kcom.infをインストールして下さい。<br>OSはWindowsXP、又はWindows2000のみ<br>対応です) |  |                     |   |

Note) The latest version of the ER7900 is “ Ver 1.01”.

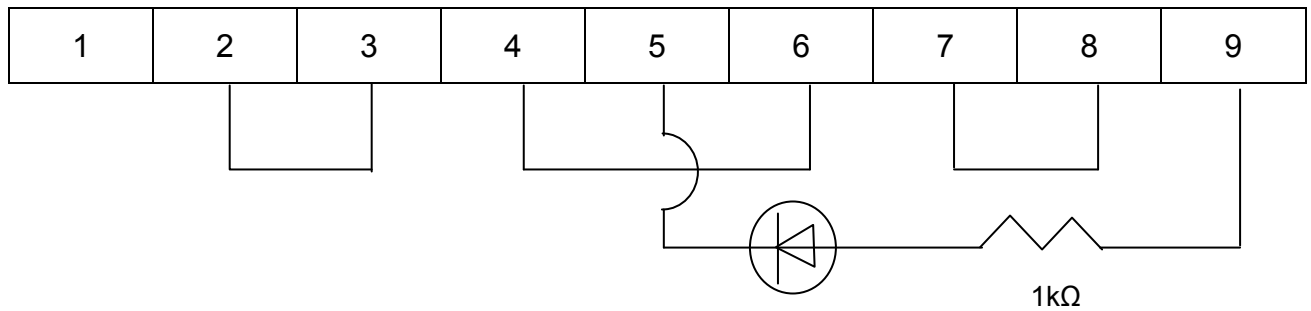
#### Appendix : jig for RS232C PORT

Testing jig = Loop back connector for barcode scanner



#### <Connecting Diagram>

D-sub 9 pin



## 5. INSTALLING SOFTWARE

In order to install software, start up “M32CPU series ECR\_LOADER”.

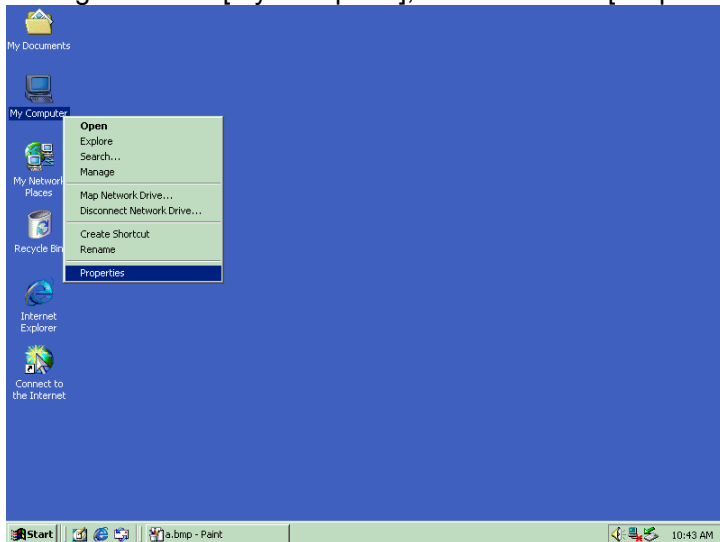
The down load is available via the USB interface. Before doing the following procedure, the PC has to install the USB-COM driver referring to “6 USB driver install”.

Please follow the instruction below in numeric order.

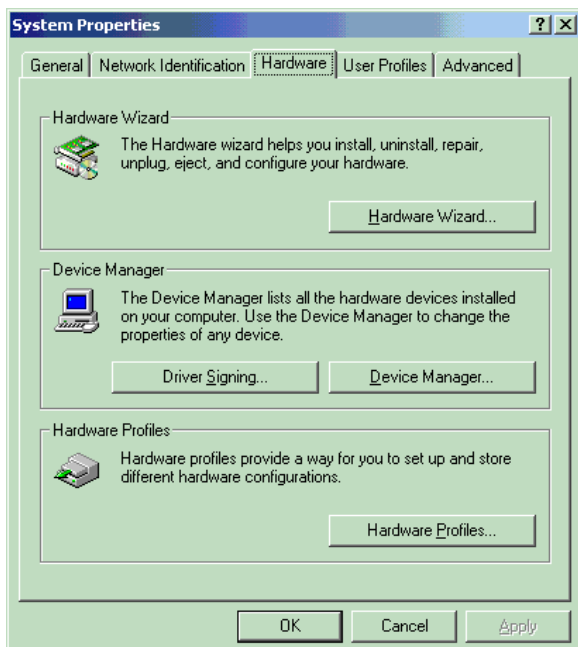
### PC side

1) First of all, please check the PC COM Port number.

Right click on [My Computer], and then Click [Properties].



2) Click [Device Manager].

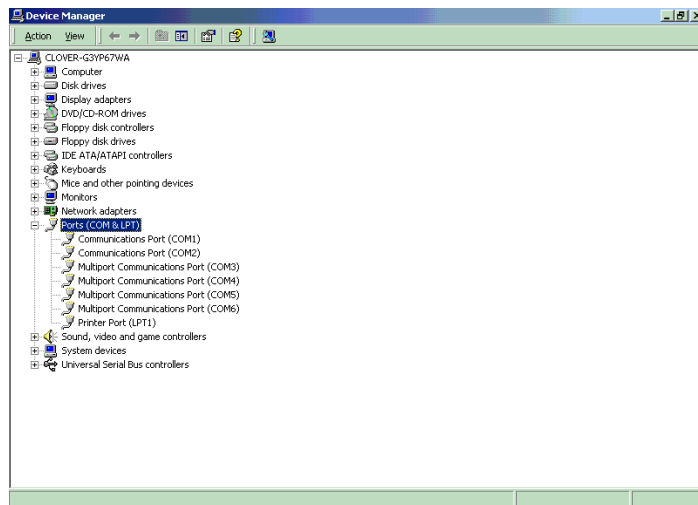




### 3) Check COM Port number.

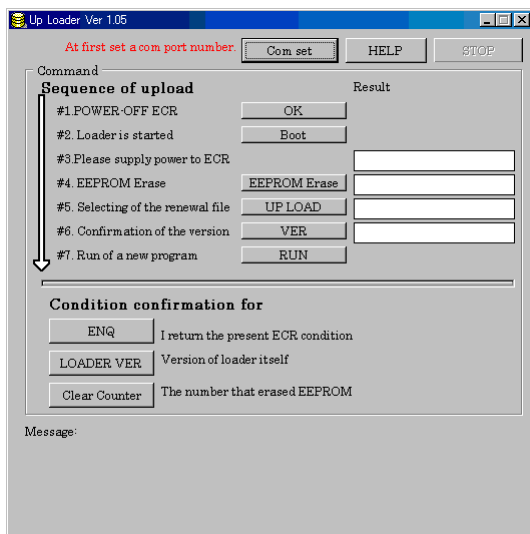
Note ) If you use usb-com conversion, there might be shown “USB Serial Port (COMn)”.

After you checked the COM Port number, please close the “device manager”.

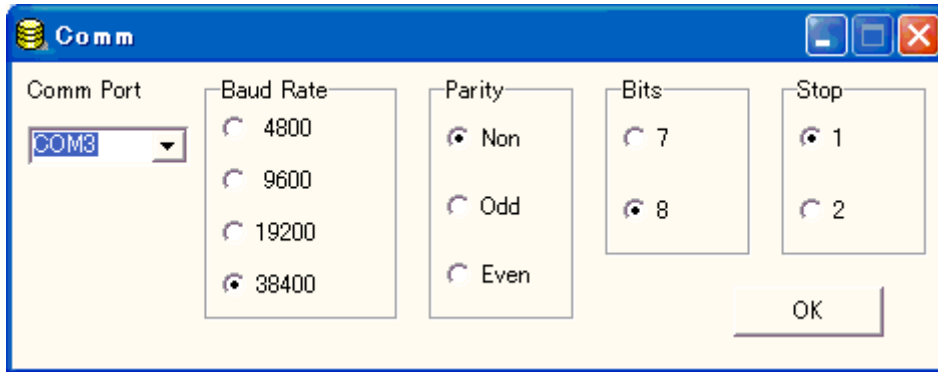


M32CUseri...

### 4) Execute Up\_loader. You can find the icon as shown.



5) Set the COM Port number using [Com set] button.



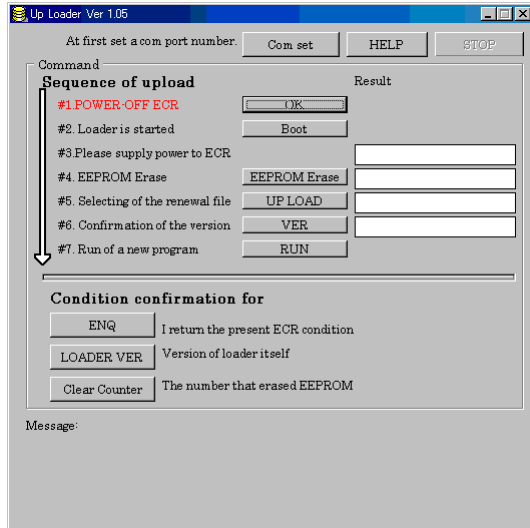
Set the COM Port number which you checked at 3).  
Click [OK].

## ECR side

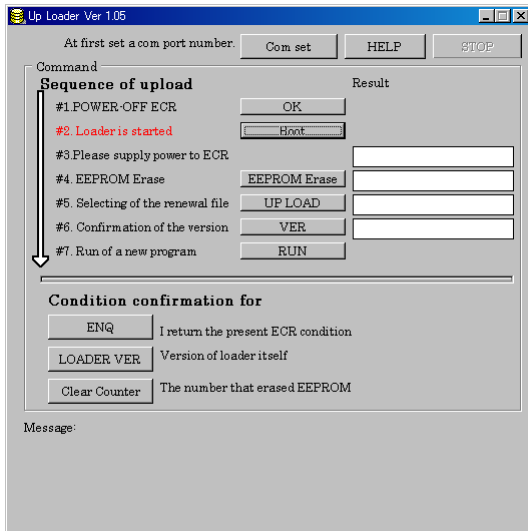
- 6) Unplug the power and remove the battery.
- 7) Connect the cable to PC.

## PC side

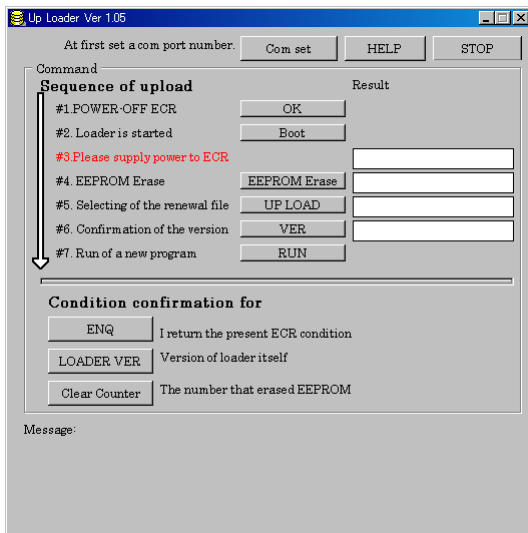
- 8) Click [OK].



9) Click [Boot] button.



10) Up Loader is waiting for the ECR start-up.

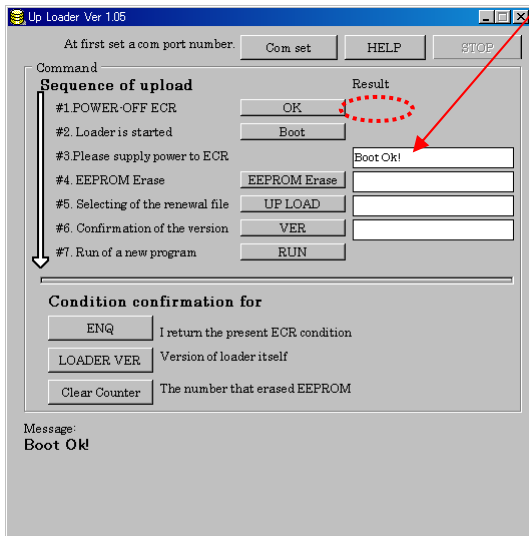


## ECR side

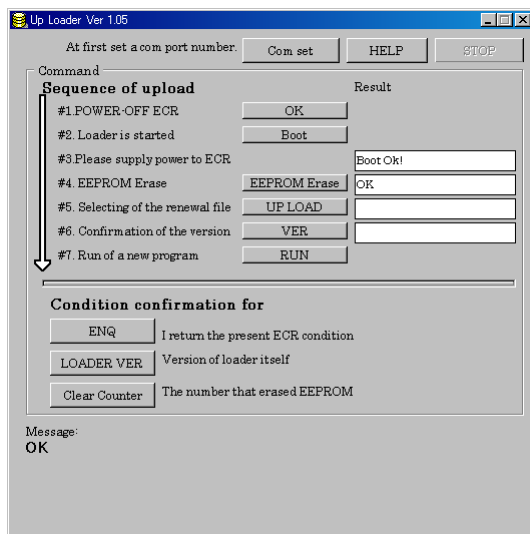
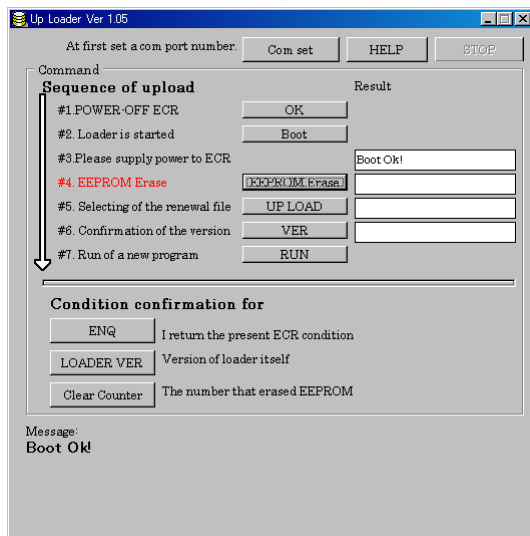
- 11) Turn on the power with depressing [1] and [9] of ten key together.  
When the connection (to PC) is confirmed, it beeps twice. ("Pi Pi")
- 12) If it doesn't perform properly at this stage, ECR side might have started up the LOADER already.  
Click [STOP] button first, and then click [ENQ] button to confirm the condition of the ECR. If the LOADER is already started up, go ahead to □.

## PC side

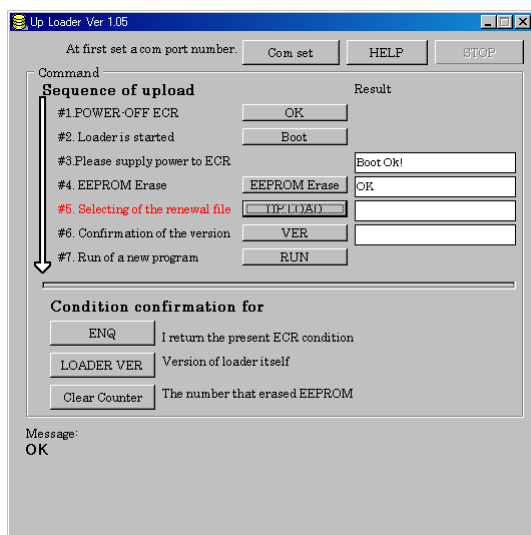
13) When it's connected to ECR, it shows [Boot OK].



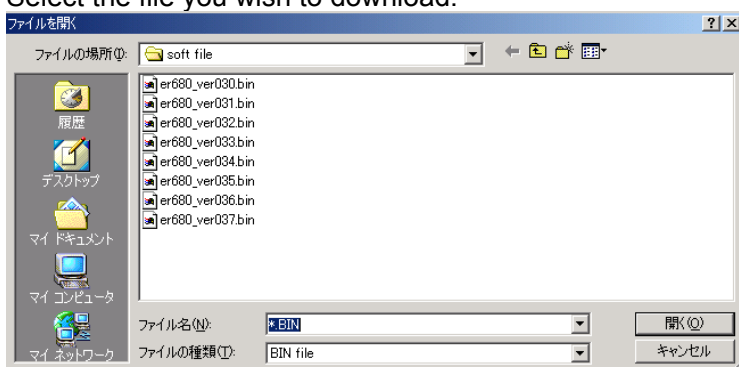
14) When it successfully done the deletion, it shows [OK].



15) Click [UP LOAD] button.

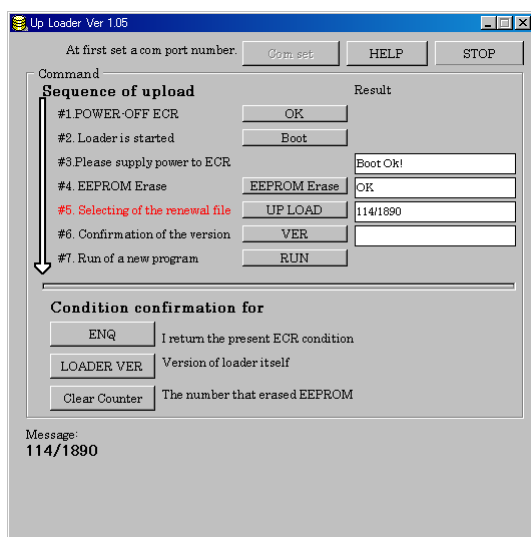


Select the file you wish to download.

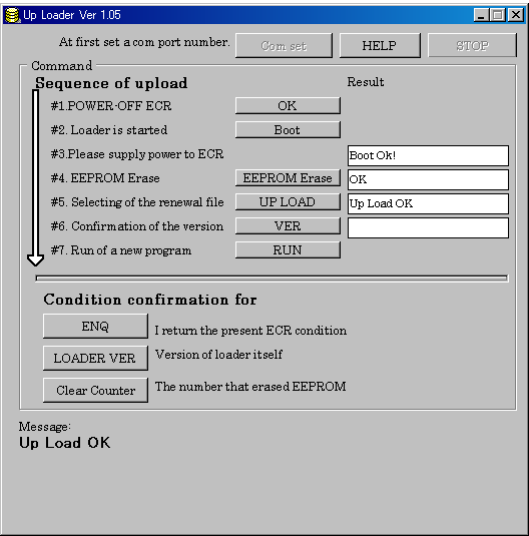


Click [Open].

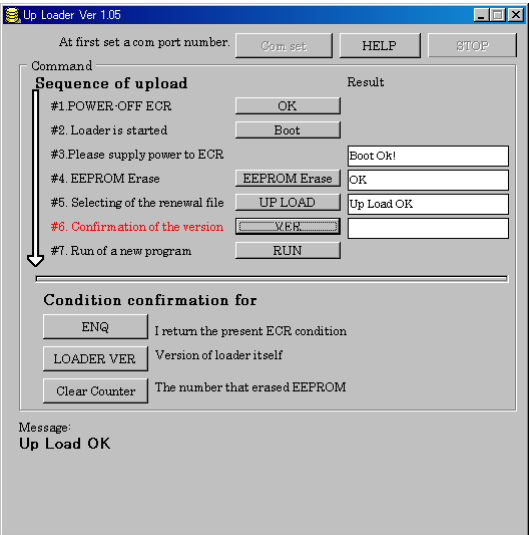
16) It shows a status for transmitting.



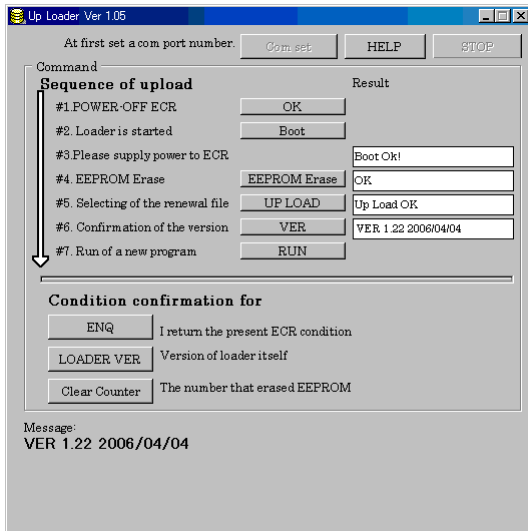
17) It shows [Up Load OK]



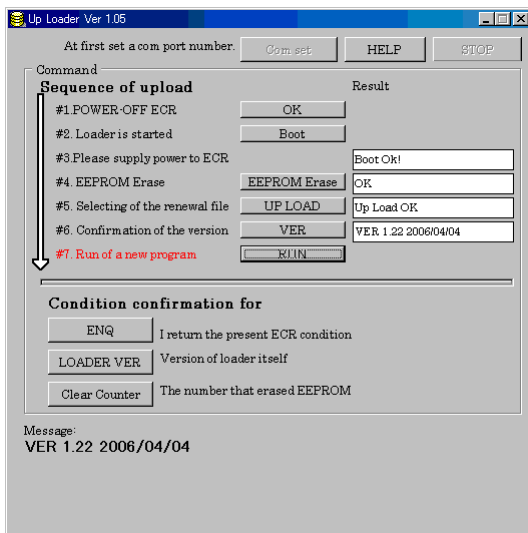
18) Click [Ver] button.



19) It shows the version which was transmitted.



20) Click [RUN] button.



ECR will be started-up by the software loaded just now.

Now that the machine has installed new software, it is required to check its functions are properly installed or not. Please go back to section 3, "DIAGNOSTIC SOFTWARE" to check the machine.

## 5-1.USB driver install

### 1. Preparation

This driver is USB-COM conversion driver. When the driver is installed, virtual COM(RS232C) port is made on the PC.

### 2.Support OS

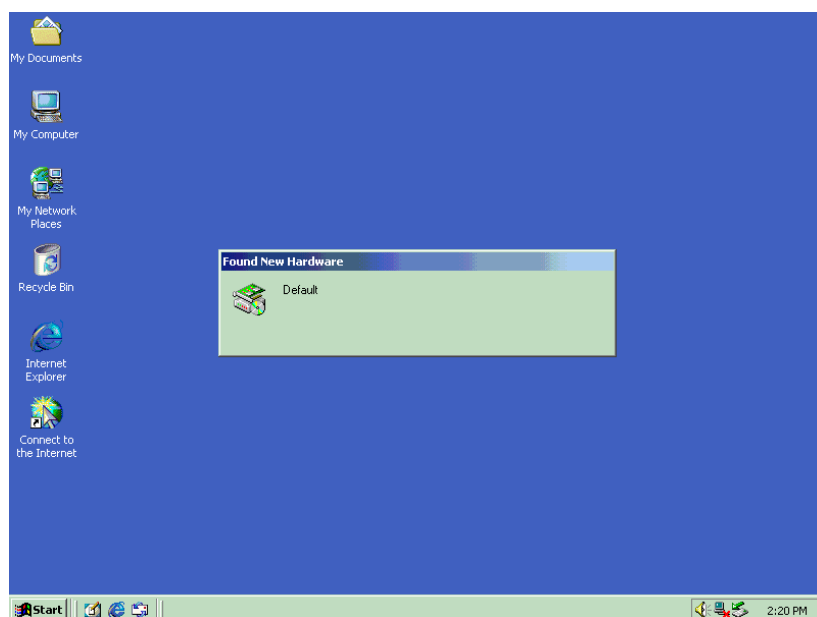
Microsoft Windows 2000,Windows XP

### 3.Driver file

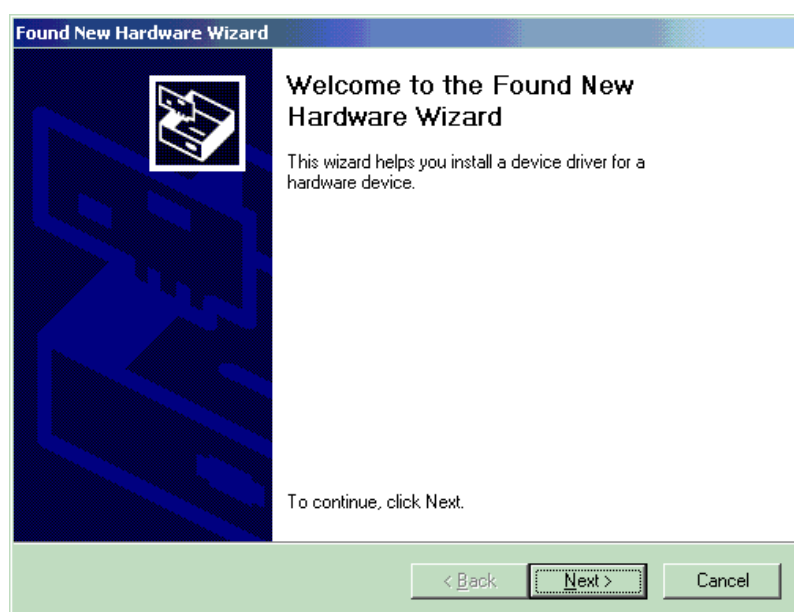
Win2kcom.inf      Note. WindowsXP uses the same file.

### 4. How to install the driver      Note. The sample screens use Windows2000

- 1) Connect the device's AC plug to the consent. And turn on the power supply of the PC.
- 2) Connect the USB cable to the PC. Device is detected.



### 3) Click the "Next".

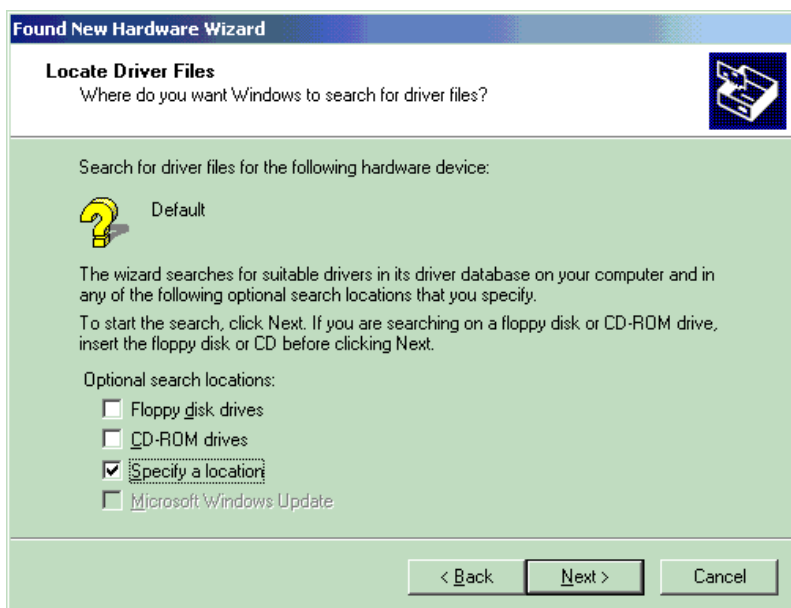




4) Click the "Next".



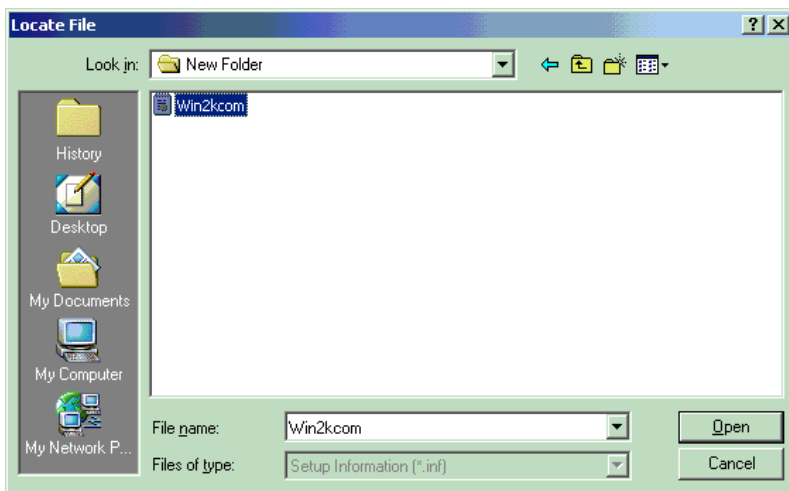
checking "Specify a location".



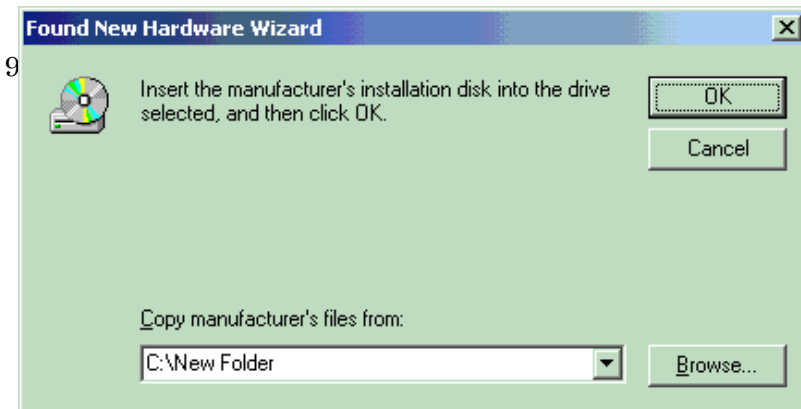
6) The folder selection screen is displayed. Click the "Browse".



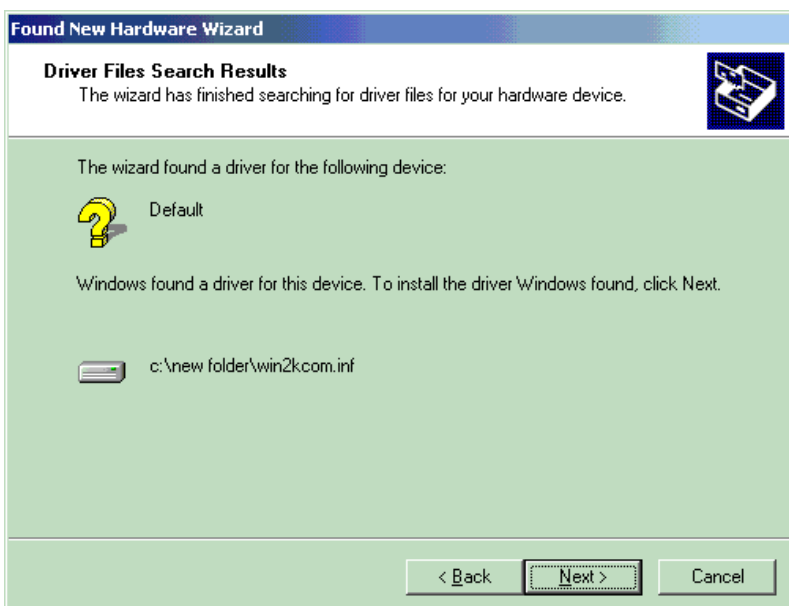
7) Please open the folder that is preserved Win2kcom.inf, and click "Open" after selecting the file.



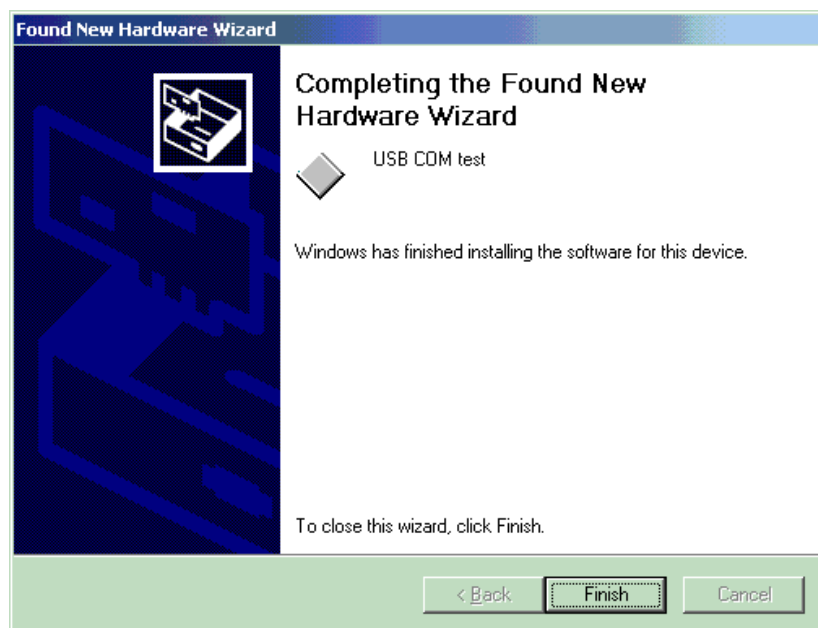
8) Click the "OK".



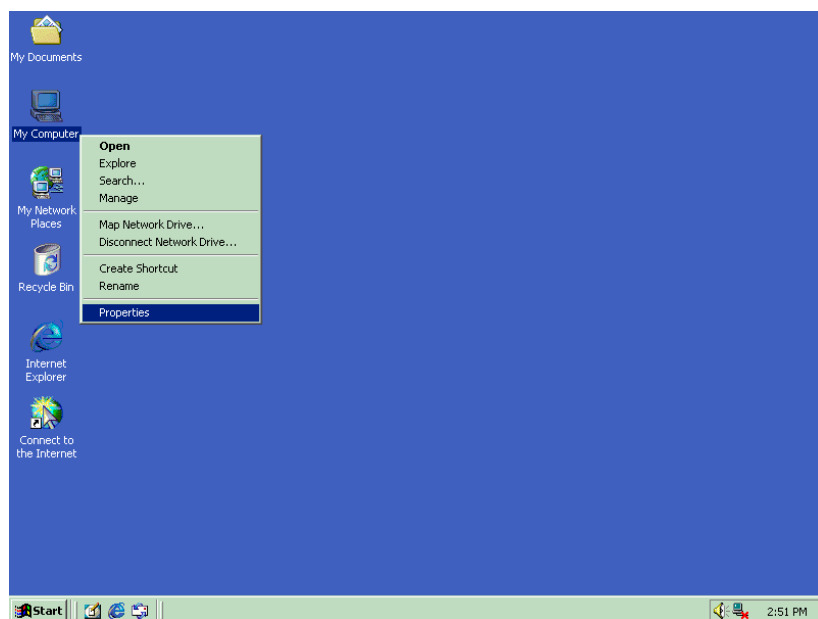
9) Click the "Next".



10) The driver's installation is completed by this operation. Please click "Finish".



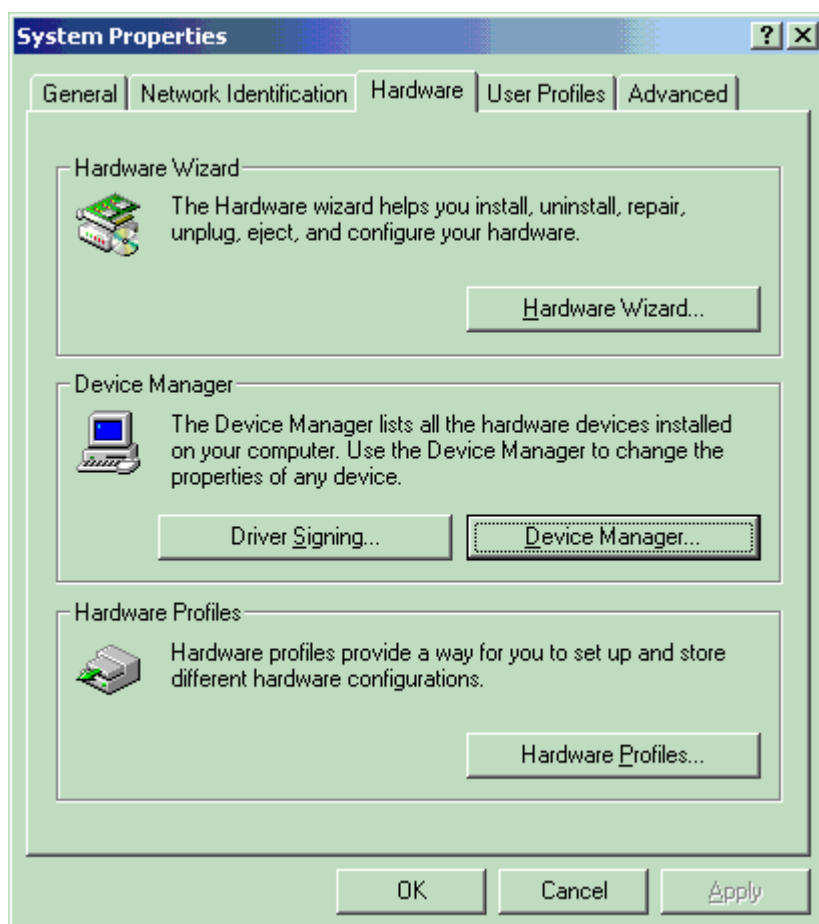
11) Next, please confirm whether the driver was normally installed.  
Please right-click at the My computer, and click "Properties".



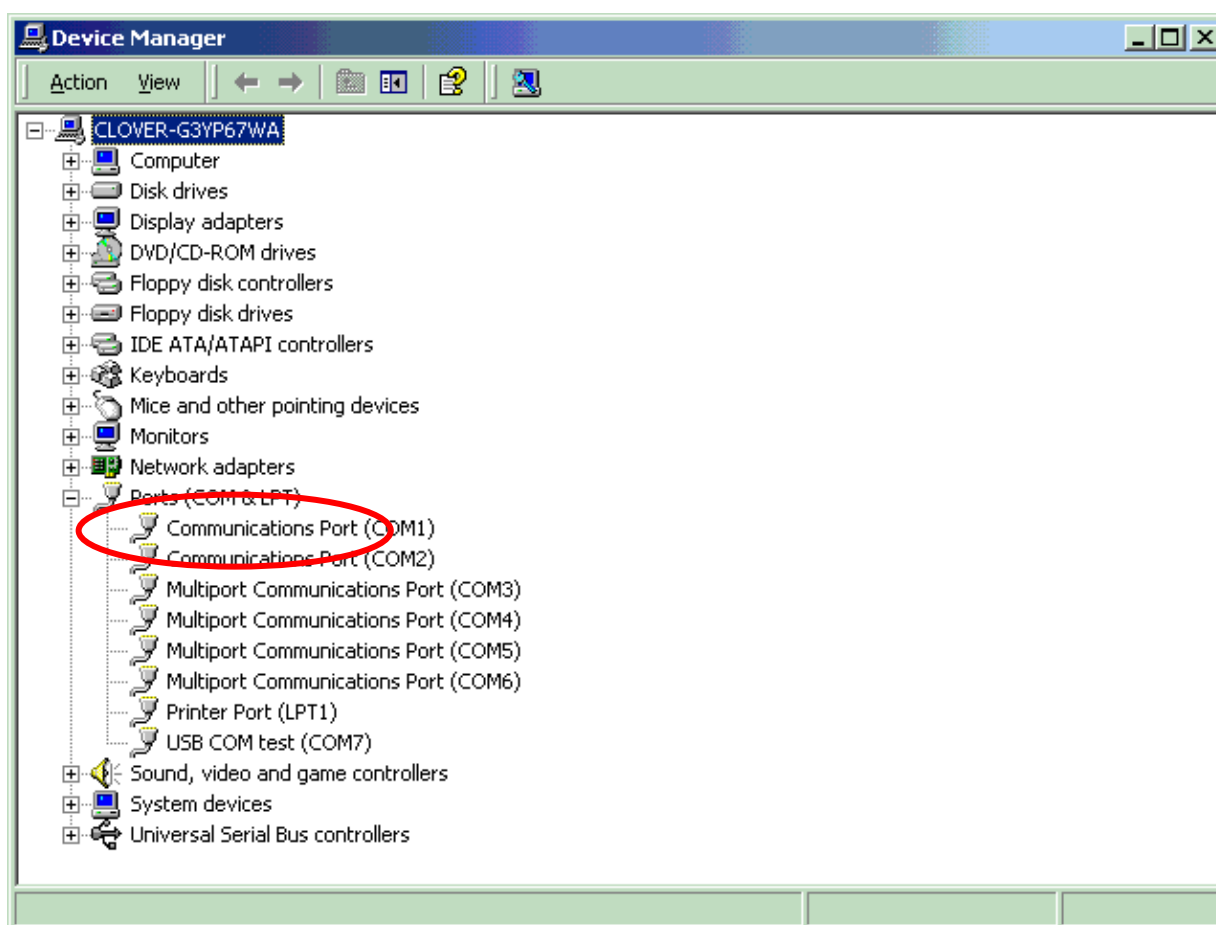
12) Click the "HardWare tab".



13) Click the "Device Manager".



- 14) Please confirm the display of "USB COM test(COMn)".  
COM7 was made in the example of the following.



## 5. DeviceClass specification

Comply with USB device class's communication device class Abstract Control Model spec.  
Please refer to "USB Class Definition for Communication Devices Version 1.1" of the USB society issue for a detailed specification.

## 6. Restriction of use

This driver emulates the RS232C operation by the USB connection.

The following usage restrictions are generated under the WindowsAPI environment.

### 1) COMSTAT structure

Neither fXoffHold nor fDsrHold are detected automatically. Please note that this function cannot be used by the application. Please correspond by the following content when using it.

**#1 fXoffHold**...Please examine receive data from the device by the application, and judge the Xon/Xoff character directly.

**#2 fDsrHold** · · · Please use GetCommModemStatus API. Sample is follows.

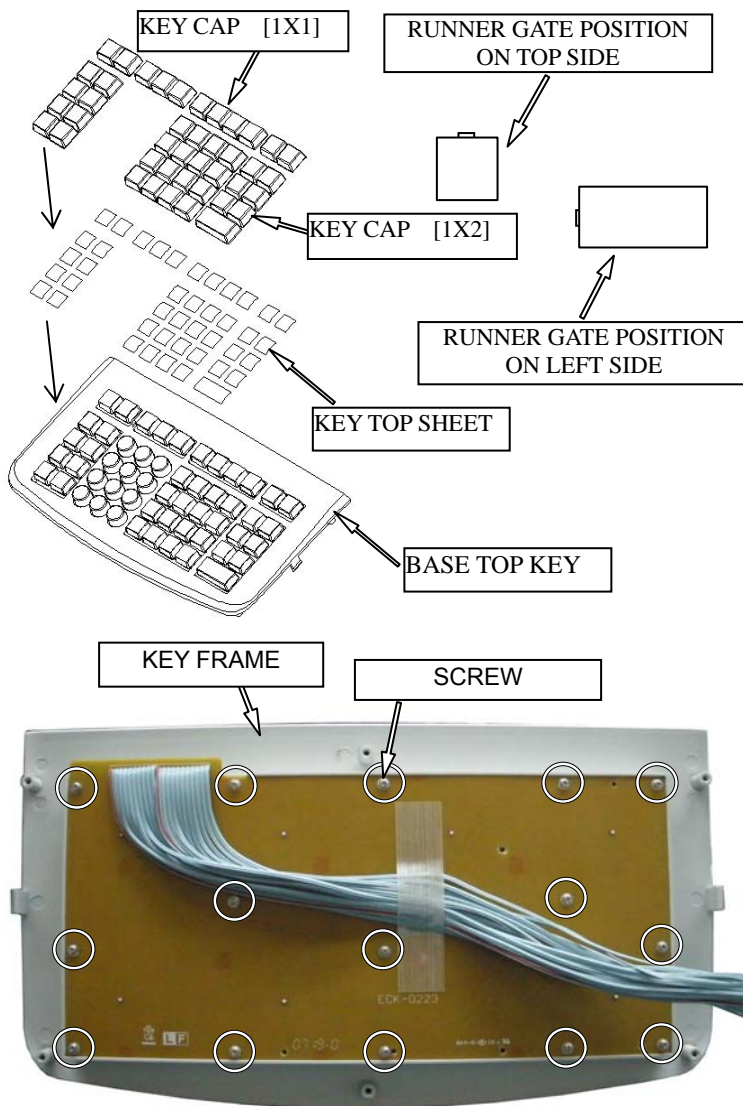
```
//C language sample source
DWORD ModemStat;
GetCommModemStatus(hCom, &ModemStat);
if(ModemStat & MS_DSR_ON)
{
    //DSR signal is on.(Device is not busy)
}
else
{
    //DSR signal is off.(Device is busy)
}
```

### 2) Virtual COM(RS232C) port

Please do not turn off the power supply of the device and do not pull out the USB cable while having opened virtual COM port by the application. After that, the port might not be able to be used until the personal computer is rebooted.

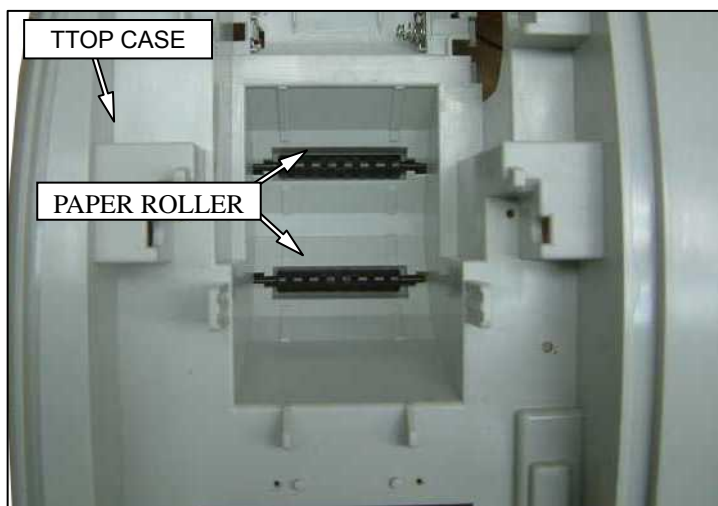
## 6. ASSEMBLY INSTRUCTION

### 6-1. TOP CASE UNIT



(1) FIX KEY TOP SHEET TO KEY CAP THEN FIX TO BASE TOP KEY.

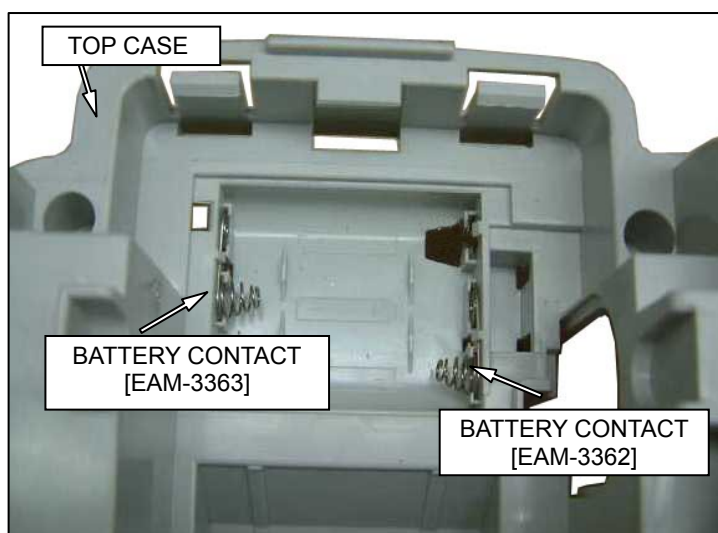
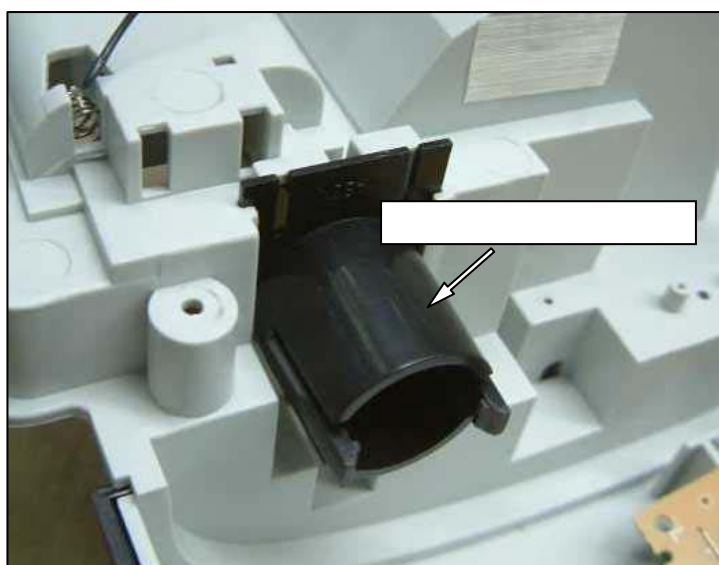
(2) FIX K/B PWB UNIT TO KEY FRAME WITH FLAT. IT MUST BE ON FITTING BOSSES POSITION THEN FASTENING 15PCS SCREW.



(3)

1] FIX 2PCS PAPER ROLLER TO TOP CASE. [AS SHOWN ON THE UPPER PICTURE ]

2] SLOT MOTOR SET PIECE TO TOP CASE. [AS SHOWN ON THE BELOW PICTURE ]

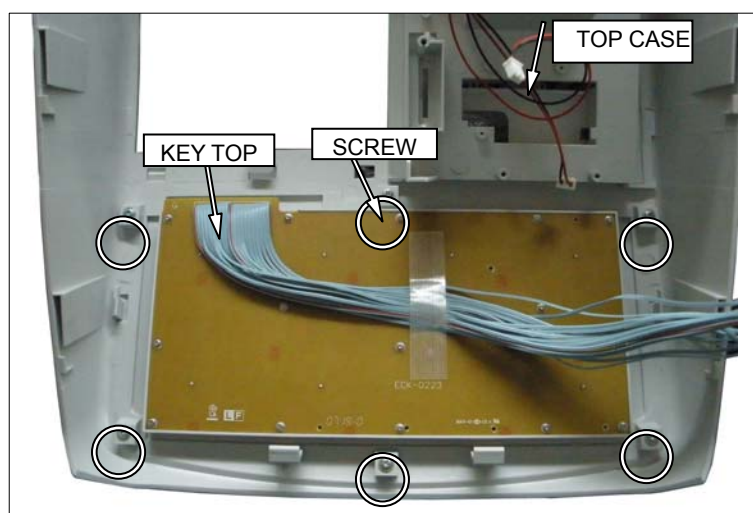


(4) FIX 2PCS BATTERY CONTACT TO TOP CASE. [LOCATION AS SHOWN ON PICTURE.]





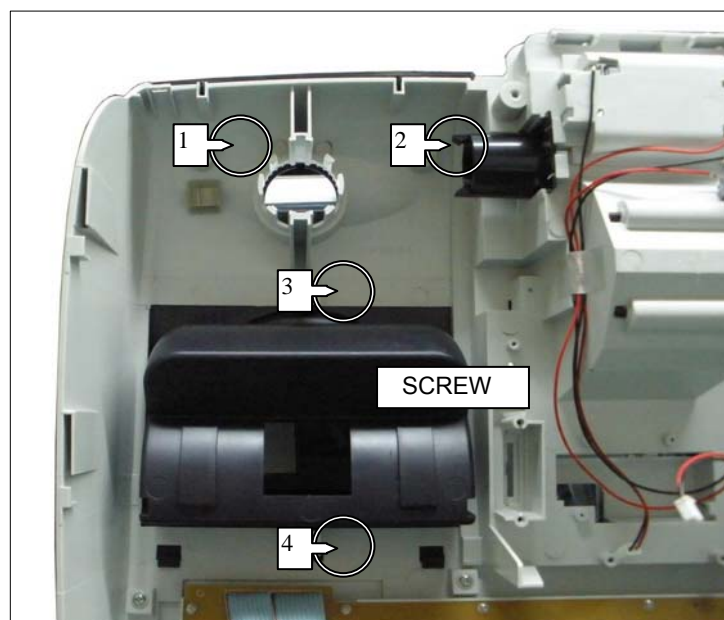
(5) FIX KEY FRAME TO TOP CASE  
PRESS UNTIL IS LOCKED.



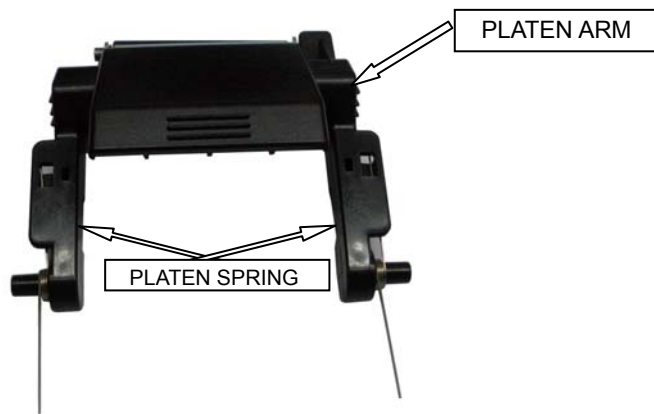
(6) FASTENING 6PCS SCREW,  
KEY FRAME TO TOP CASE.



(7)  
 1] APPEARANCE CHECK LCD COVER.  
 2] FIX LCD COVER TO TOP CASE.  
 [AS SHOWN ON PICTURE.]



(8) FIX LCD COVER TO TOP CASE  
 BY FASTENING 4PCS SCREW.



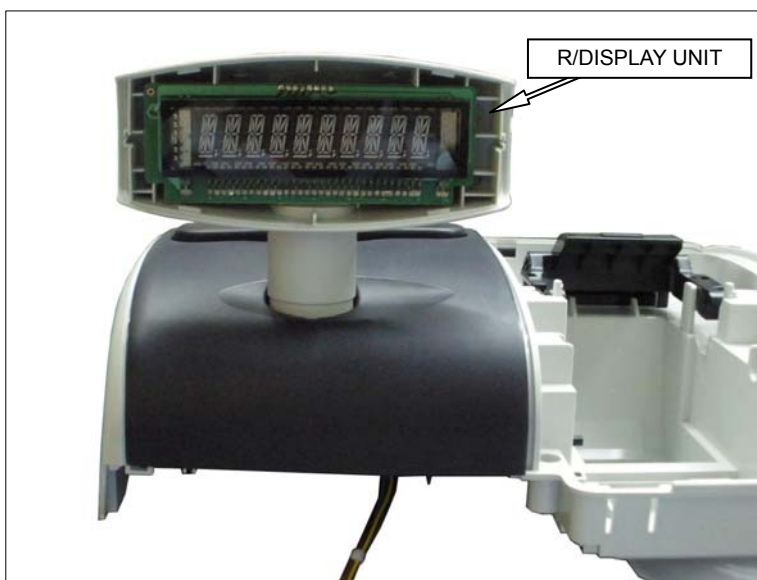
(9) FIX 2PCS PLATEN SPRING TO PLATEN ARM THEN FIX TO TOP CASE.



(10) FIX LCD MODULE UNIT TO TOP CASE.

NOTE: The display unit is described in the next section (6-2).





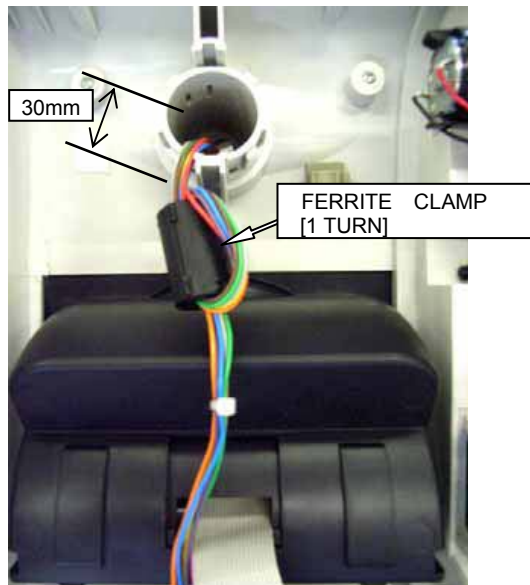
(11)

1] FIX R/DISPLAY UNIT TO TOP CASE.

2] CHECK AND CLEAN REMOTE FILTER AND DISPLAY TUBE BY USE METHANOL.

3] FIX REMOTE FILTER TO R/DISPLAY CASE. [AS SHOWN ON PICTURE.]





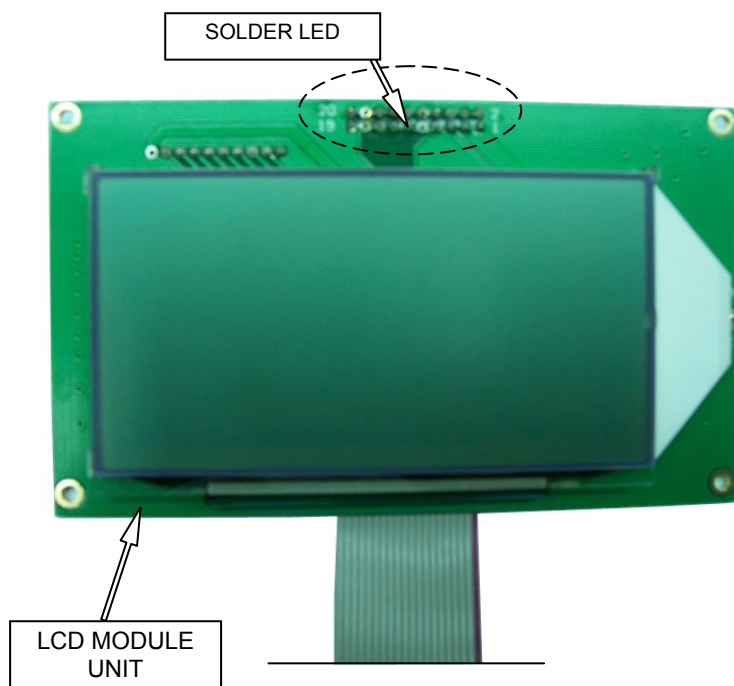
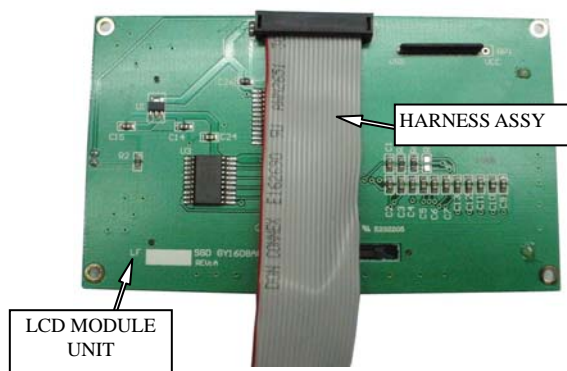
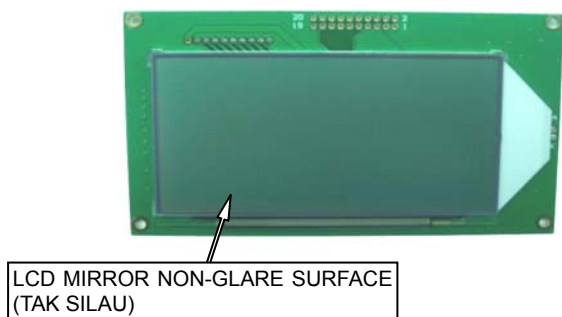
(12)  
 1]CLIP FERRITE CLAMP TO HARNESS ASSY THEN TURN ONE ROUND TO FERRITE  
 2] CLIP HARNESS ASSY TO CORD CLAMP. [AS SHOWN ON PICTURE.]





## 6-2. Display unit ASSY

(1) INSERT HARNESS ASSY LCD MODULE UNIT.



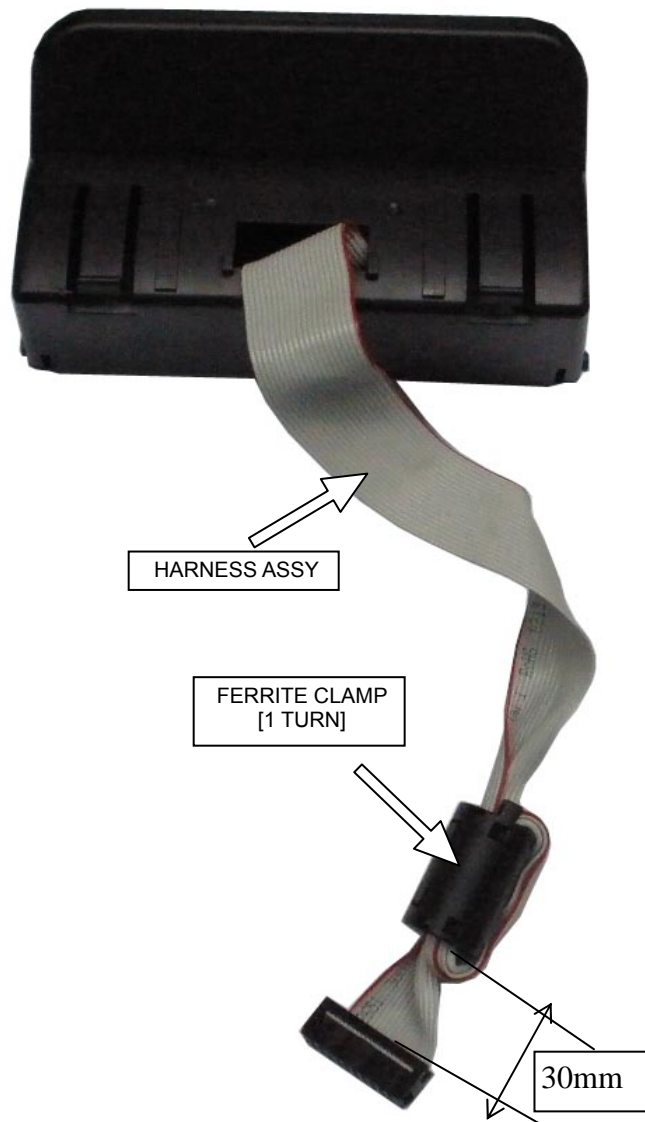
(2) SOLDER HARNESS ASSY TO LCD MODULE UNIT.



(3)

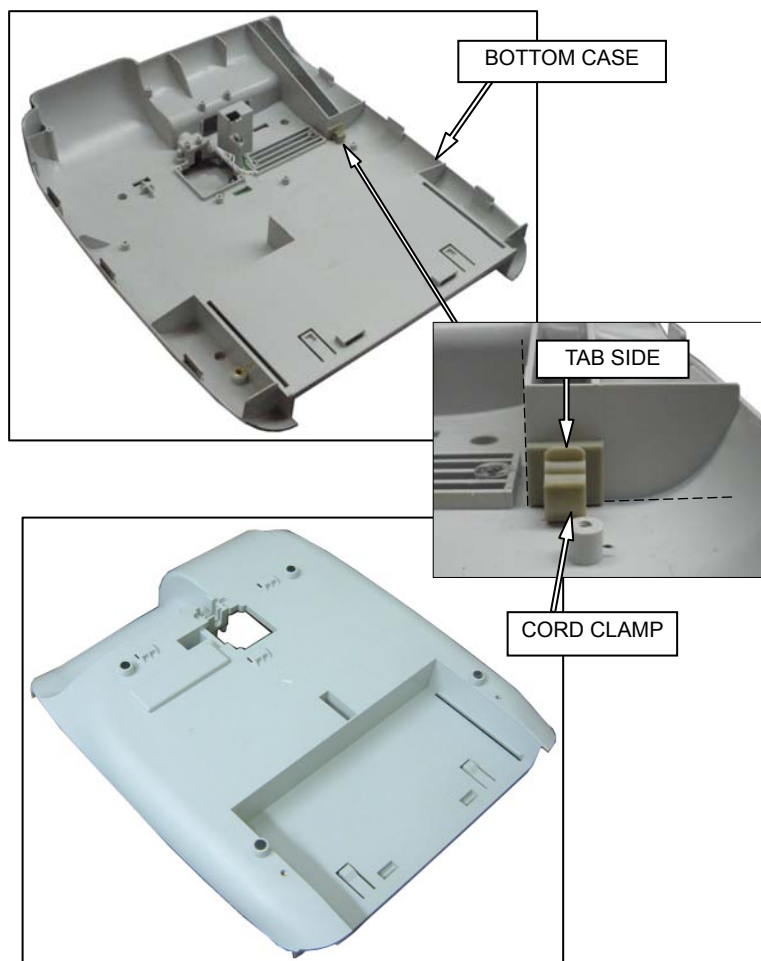
- 1] SLOT LCD MODULE HARNESS ASSY TO LCD REAR CASE.
- 2] FIX LCD MODULE TO LCD REAR CASE.
- 3] FIX LCD FRONT CASE TO LCD REAR CASE AND PREES UNTIL IS LOCKED.

(4) CLIP FERRITE CLAMP TO HARNESS ASSY AND TURN ONE ROUND TO FERRITE CLAMP.

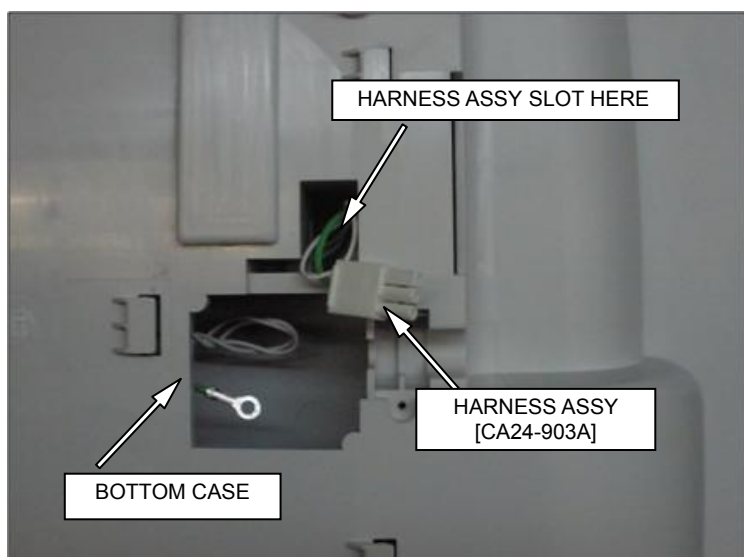




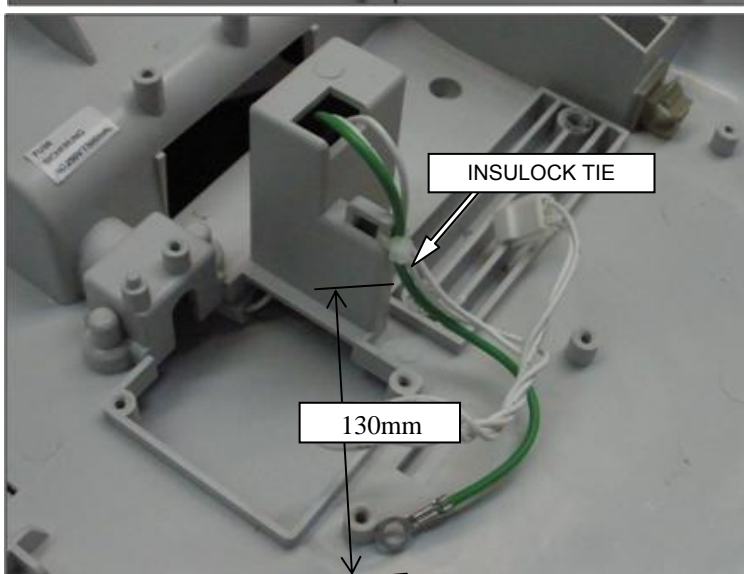
### 6-3. Bottom case unit ASSY

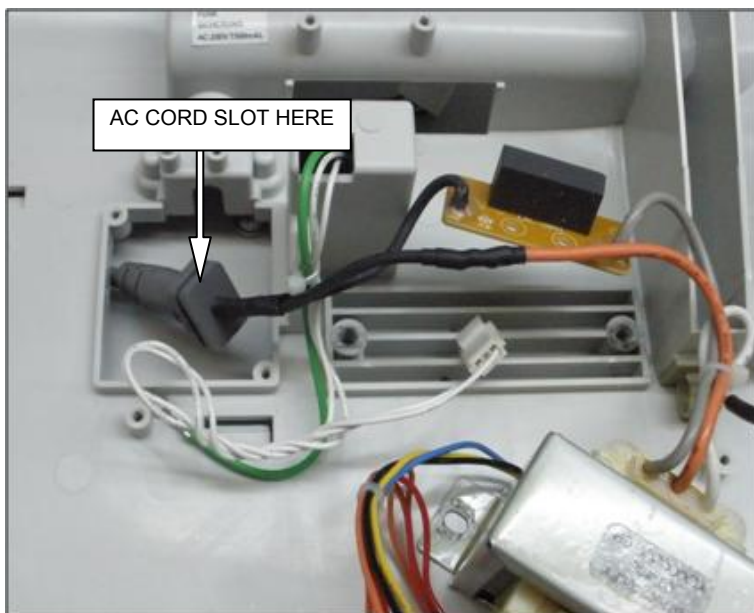


- (1)  
1]APPEARANCE CHECK THE  
BOTTOM CASE.  
2]STICK CORD CLAMP TO  
BOTTOM CASE. [LOCATION AS  
SHOWN ON PICTURE.]

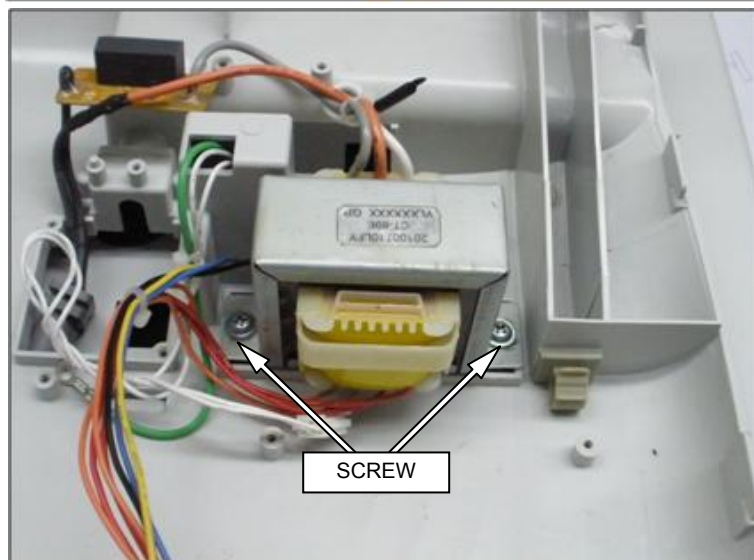


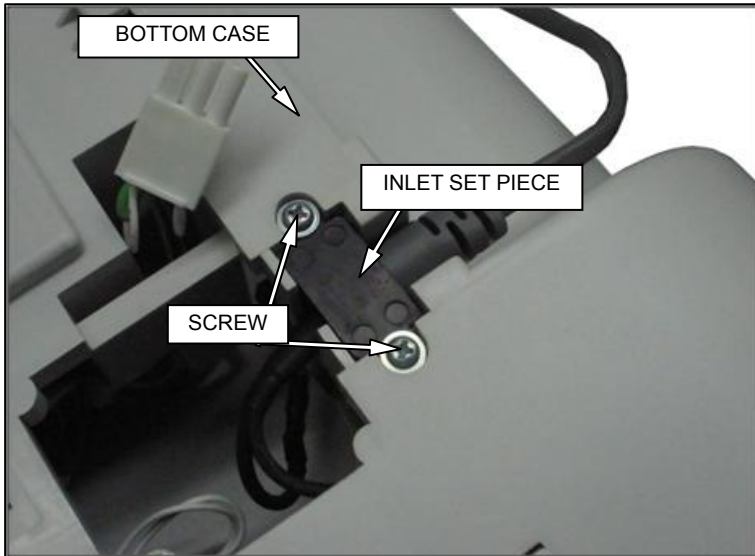
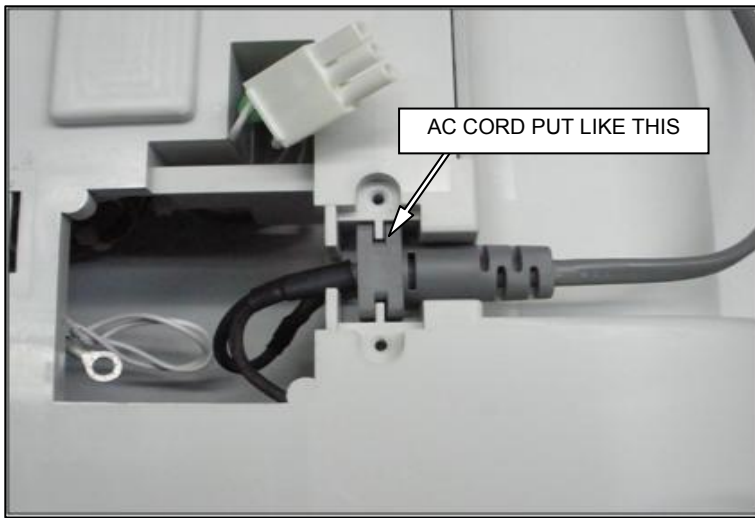
- (2)
- 1) SLOT HARNESS ASSY TO BOTTOM CASE. [FOLLOW THE PICTURE AS SHOWN ON FIGURE.]
  - 2) TIE TOGETHER HARNESS ASSY WITH BOTTOM CASE BY USE INSULOCK TIE. [AS SHOWN ON PICTURE.]



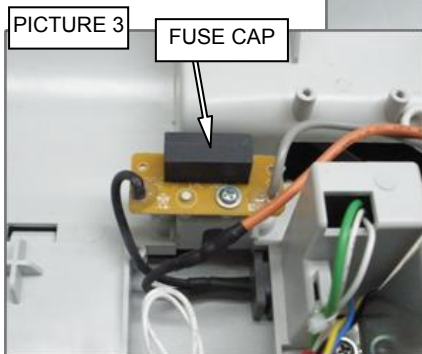
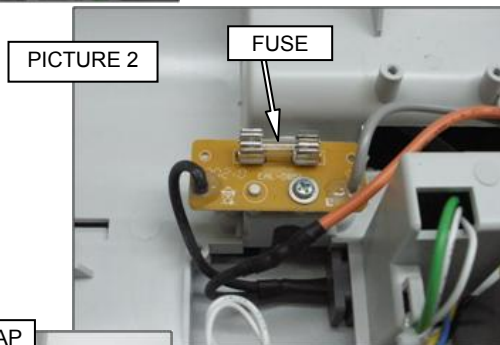
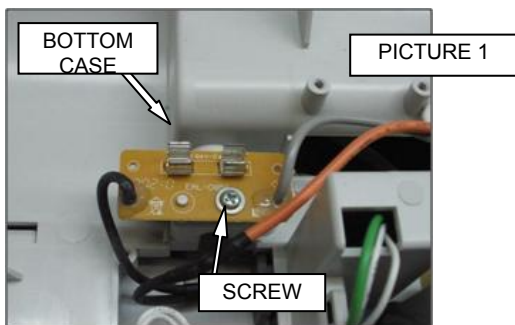


(4) FIX TRANSFORMER UNIT TO DRAWER UNIT BY FASTENING 2PCS SCREW.

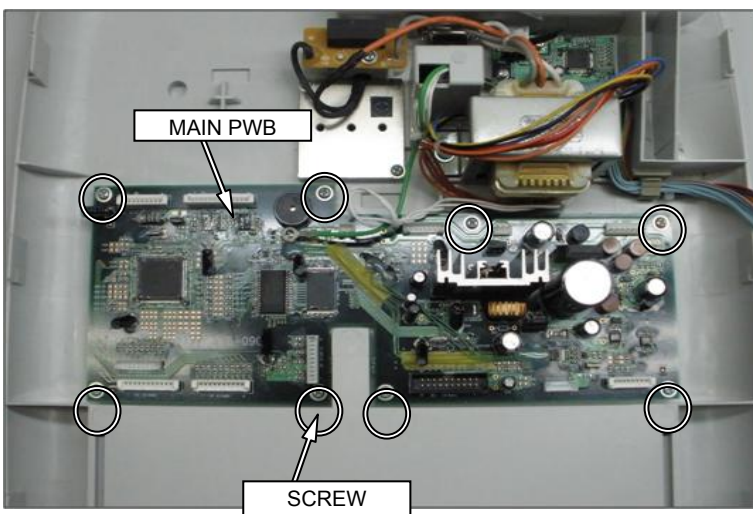




- (5)
- 1] FIX AC CORD TO BOTTOM CASE.
  - 2] FIX INLET SET PIECE TO BOTTOM CASE BY FASTEN 2PCS SCREW. [AS SHOWN ON PICTURE]

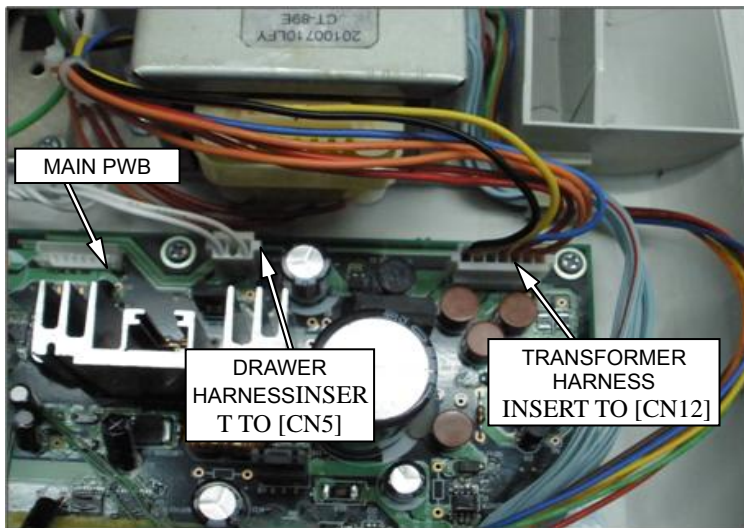


- (6)
- 1] FIX FUSE HOLDER PWB TO BOTTOM CASE BY FASTENING 1PC SCREW. [AS ON PICTURE 1.]
  - 2] SLOT FUSE TO FUSE HOLDER. [AS ON PICTURE 2.]
  - 3] FIX FUSE CAP TO FUSE HOLDER. [AS ON PICTURE 3.]

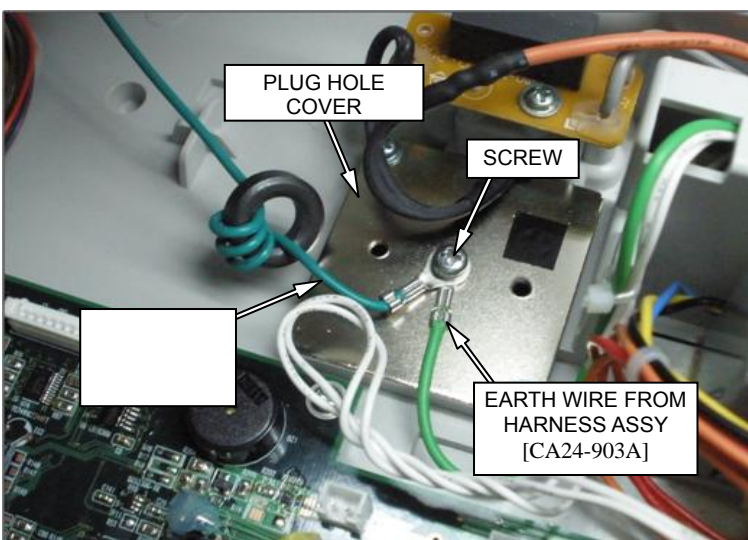
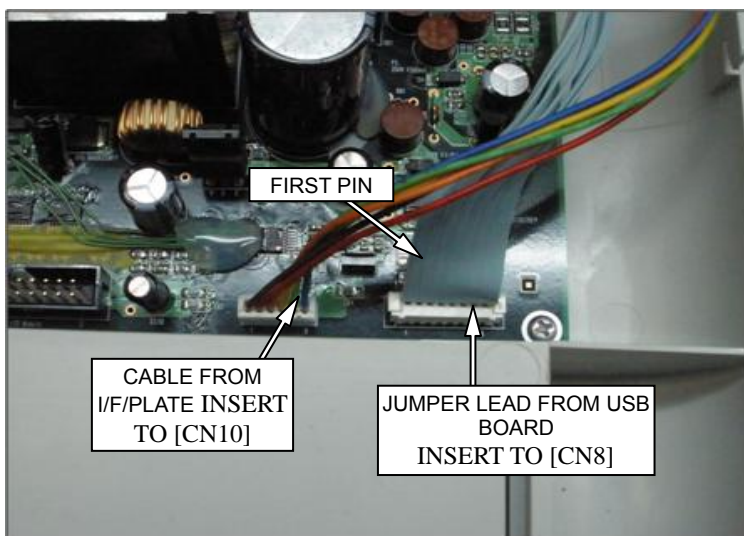


- (7) FASTEN 8PCS SCREW, MAIN PWB TO BOTTOM CASE.

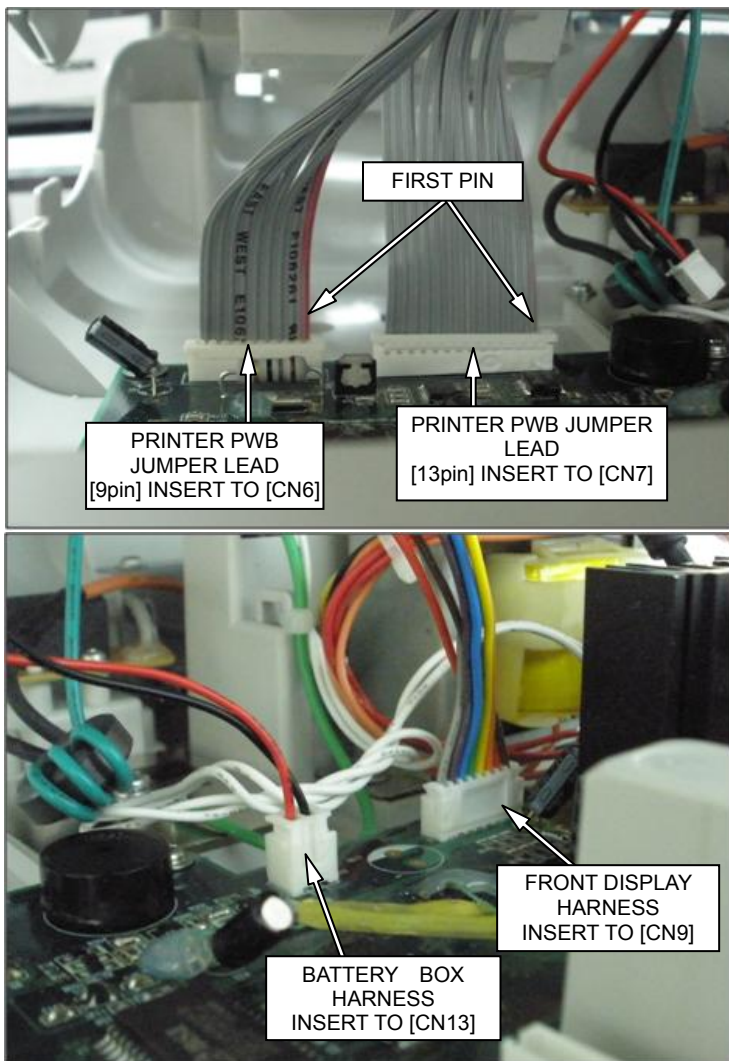




- (8)
- 1] INSERT DRAWER CONNECTOR AND TRANSFORMER CONNECTOR TO MAIN PWB UNIT. [AS ON PICTURE]
  - 2] INSERT USB JUMPER LEAD AND I/F/PLATE CABLE TO MAIN PWB.

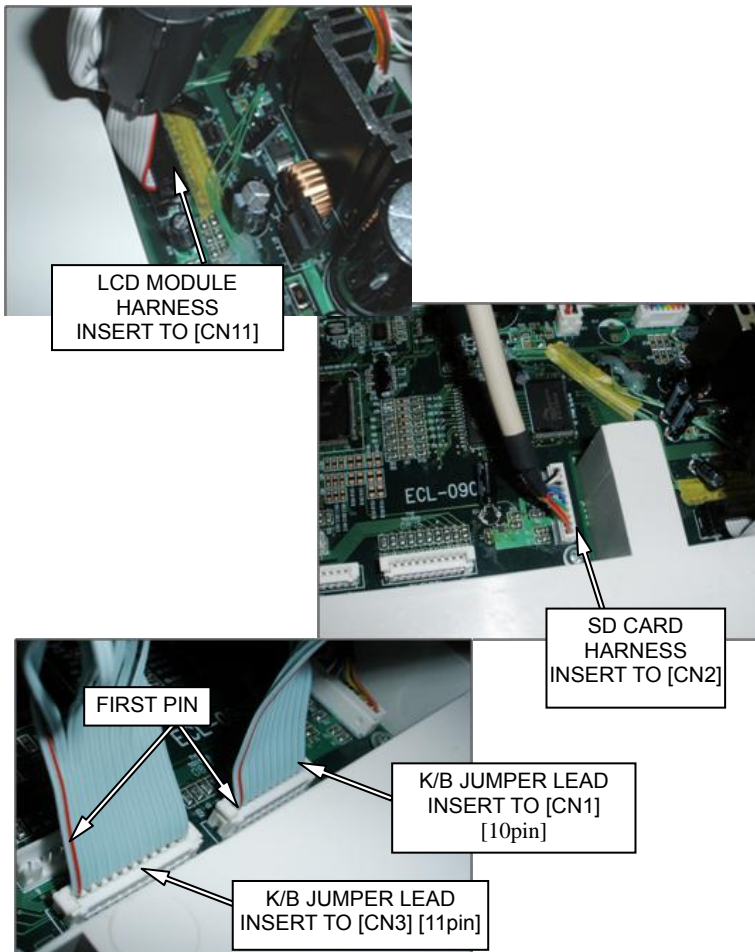


- (9) FIX PRINTER EARTH WIRE AND DRAWER EARTH WIRE TO UPPER PLATE THEN FASTENING 1PC SCREW.



(10) INSERT DISPLAY HARNESS, BATTERY BOX HARNESS AND PRINTER PWB JUMPER LEAD TO MAIN PWB. [LOCATION AS SHOWN ON PICTURE.]

(11) INSERT LCD MODULE HARNESS, SD CARD HARNESS AND K/B JUMPER LEAD TO MAIN PWB. [LOCATION AS SHOWN ON PICTURE.]

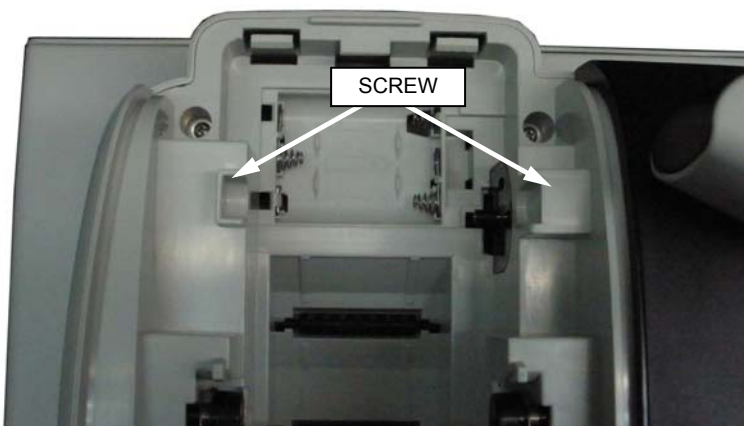




(12) FIX SEMI SET TO BOTTOM CASE

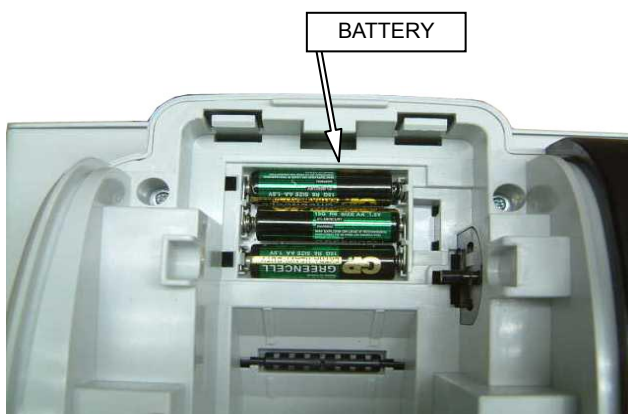


(13) FASTEN 2PCS SCREW, TOP CASE TO BOTTOM CASE.





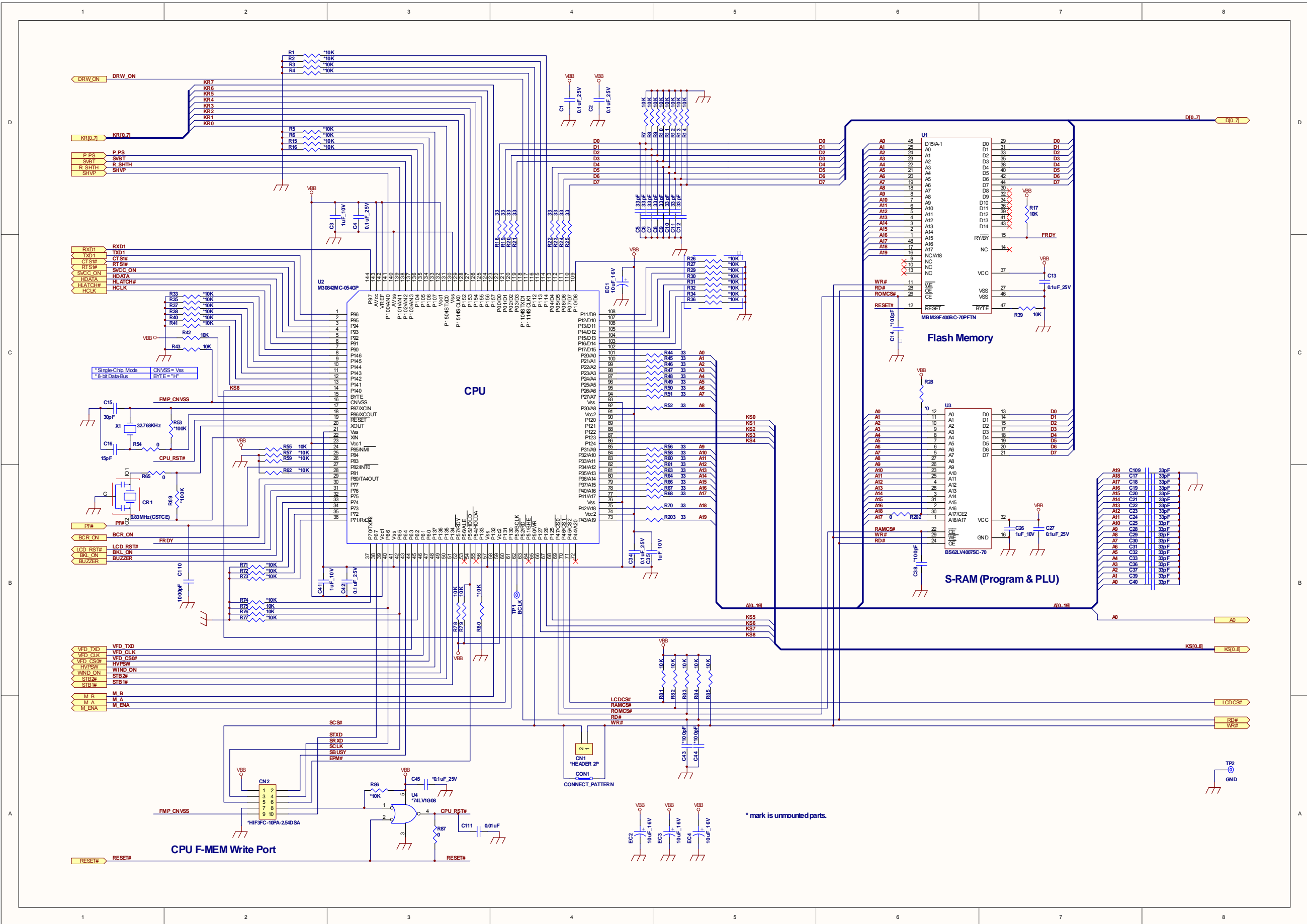
(14) FIX KEY FRAME TO TOP CASE PRESS UNTIL IS LOCKED.

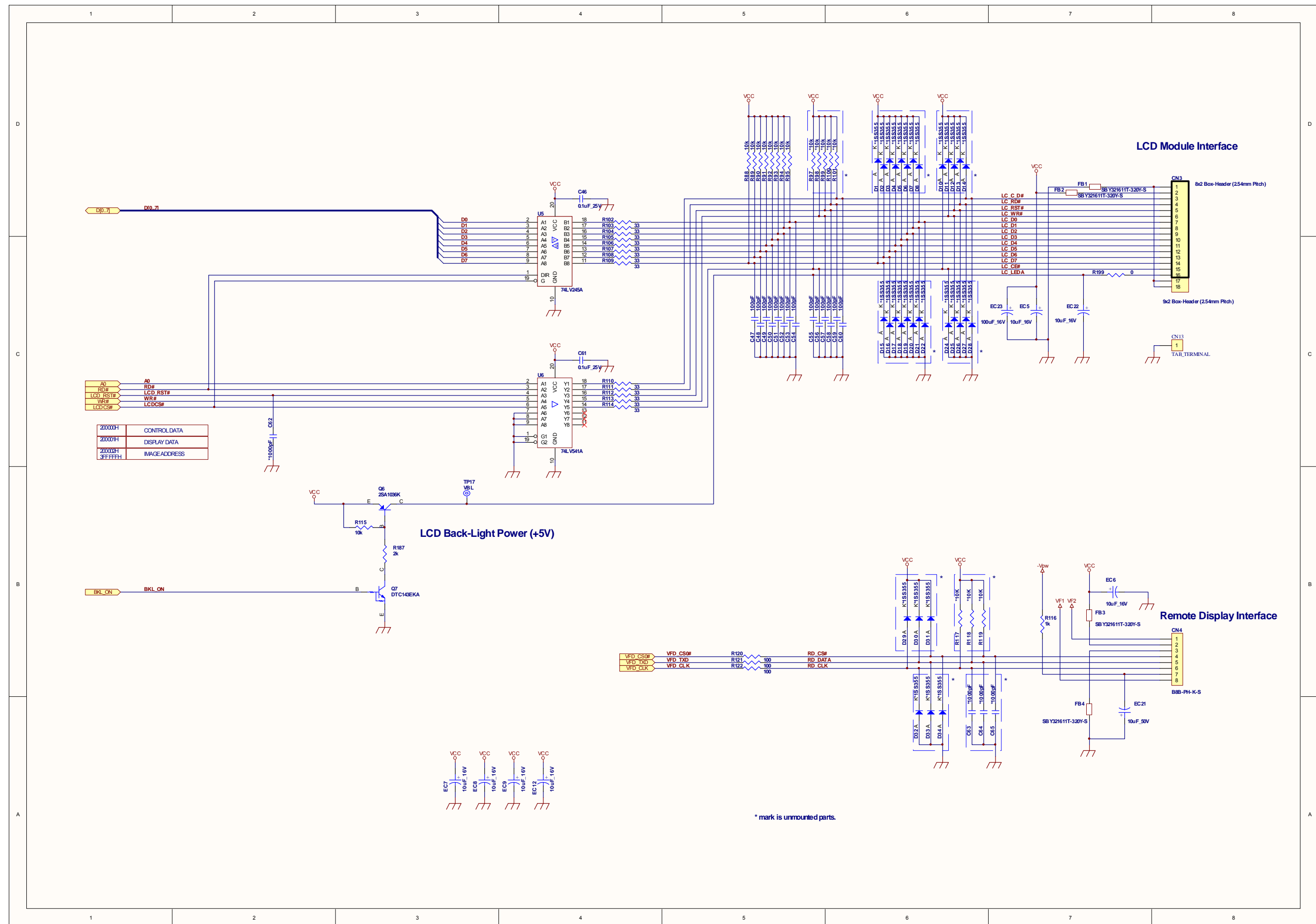


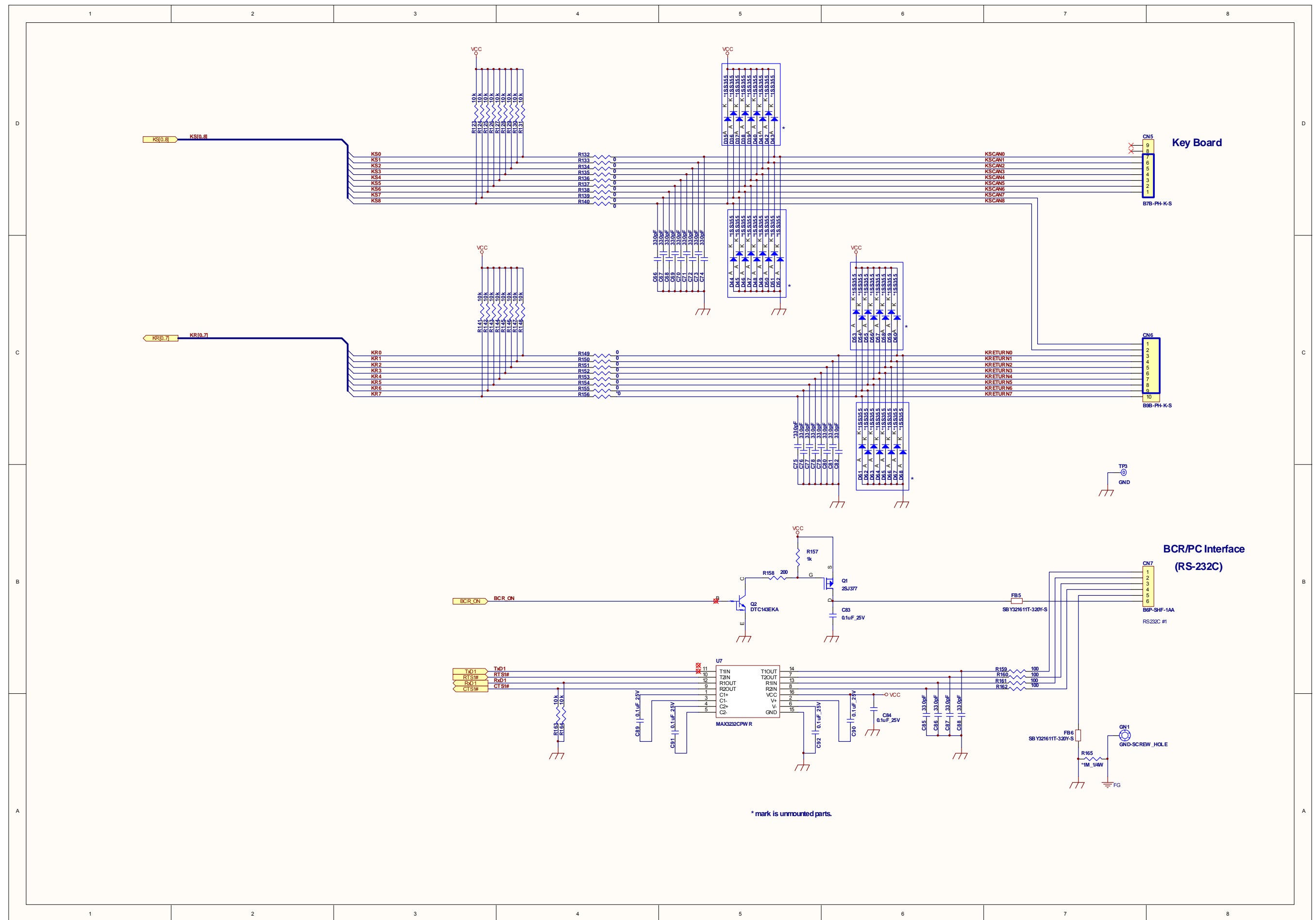
(15) COplete AND FUNCTION TEST.

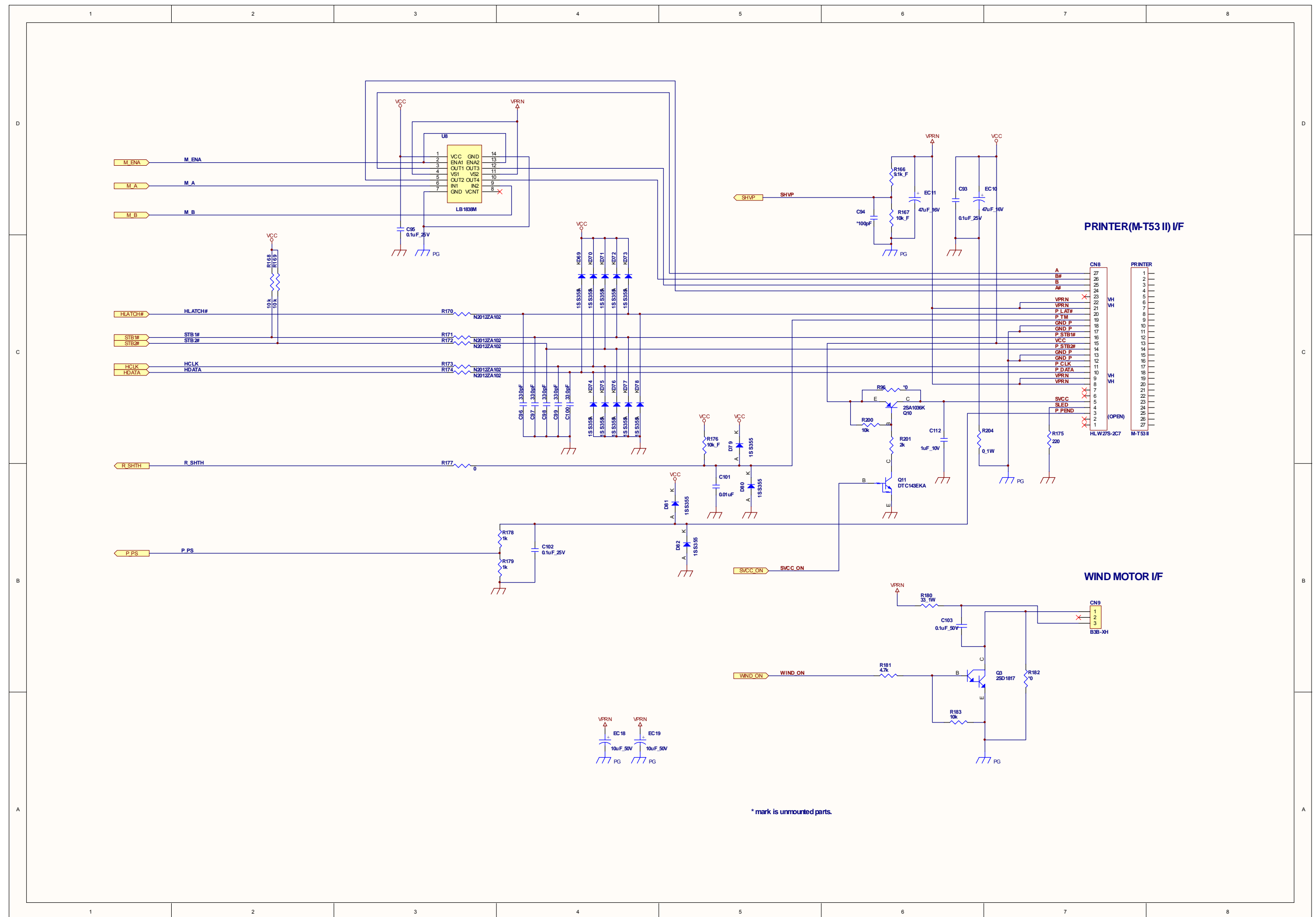


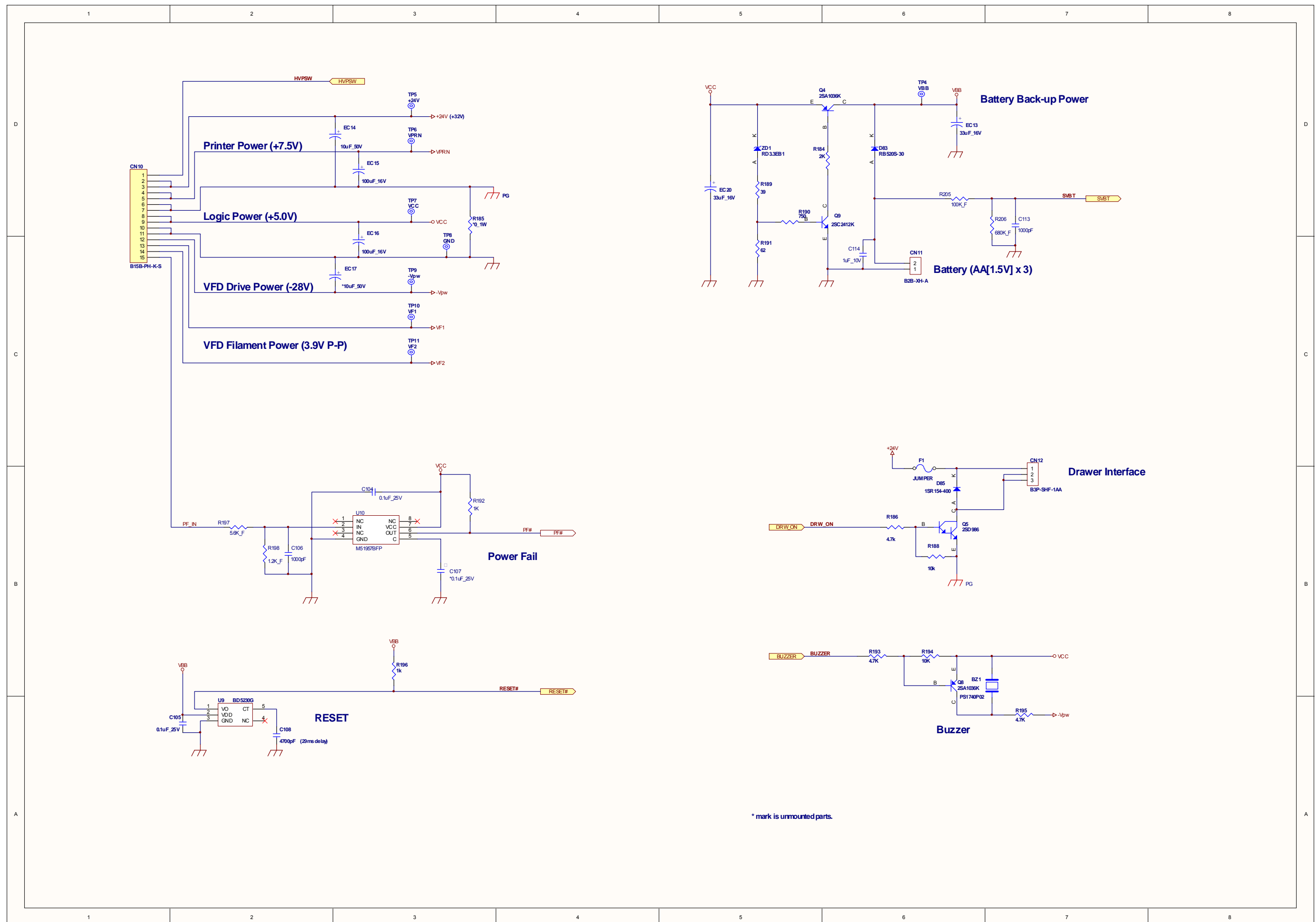
# 8. CIRCUIT DIAGRAM

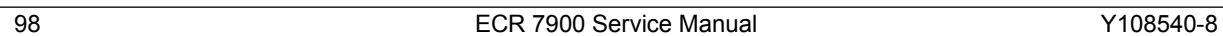




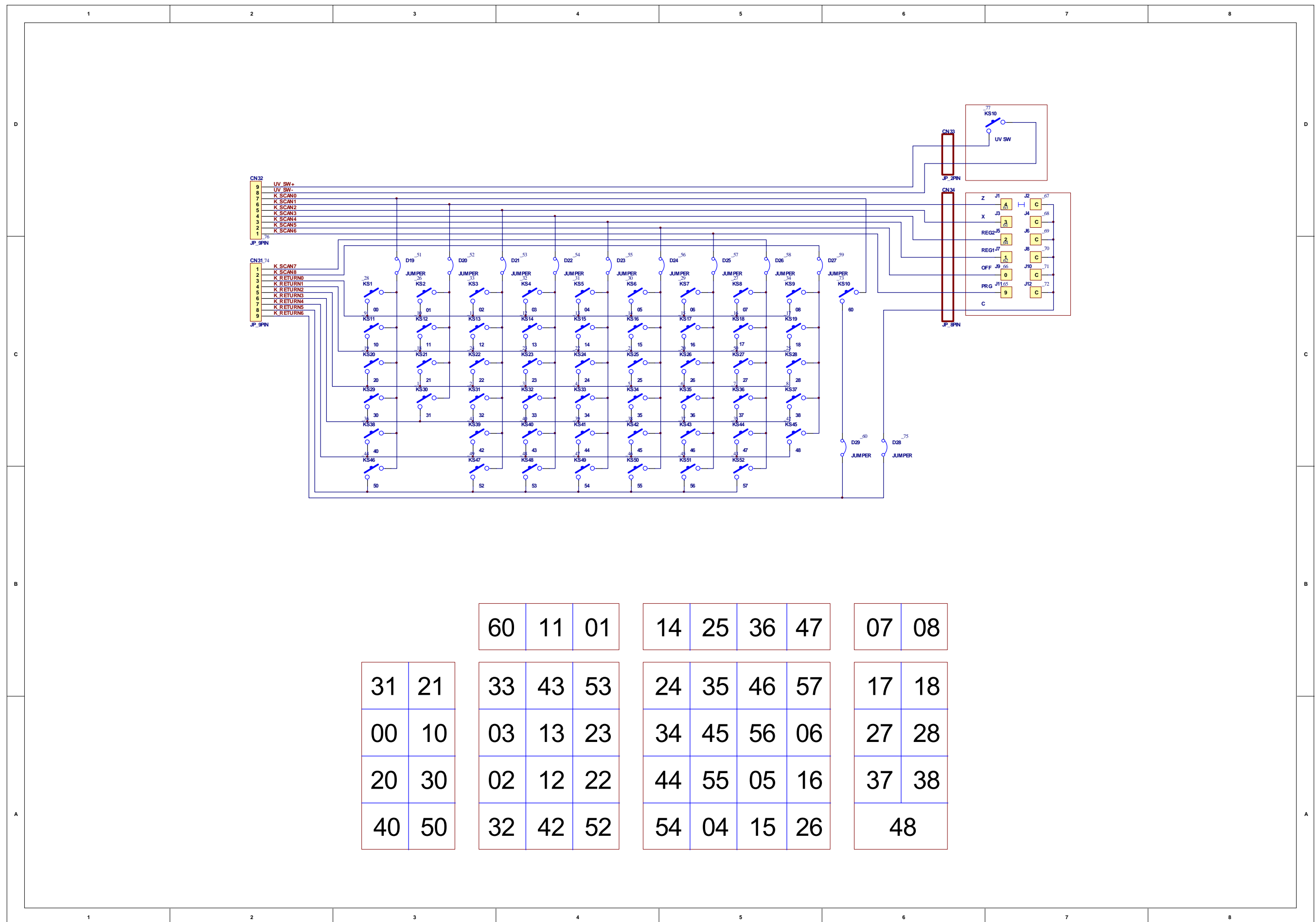


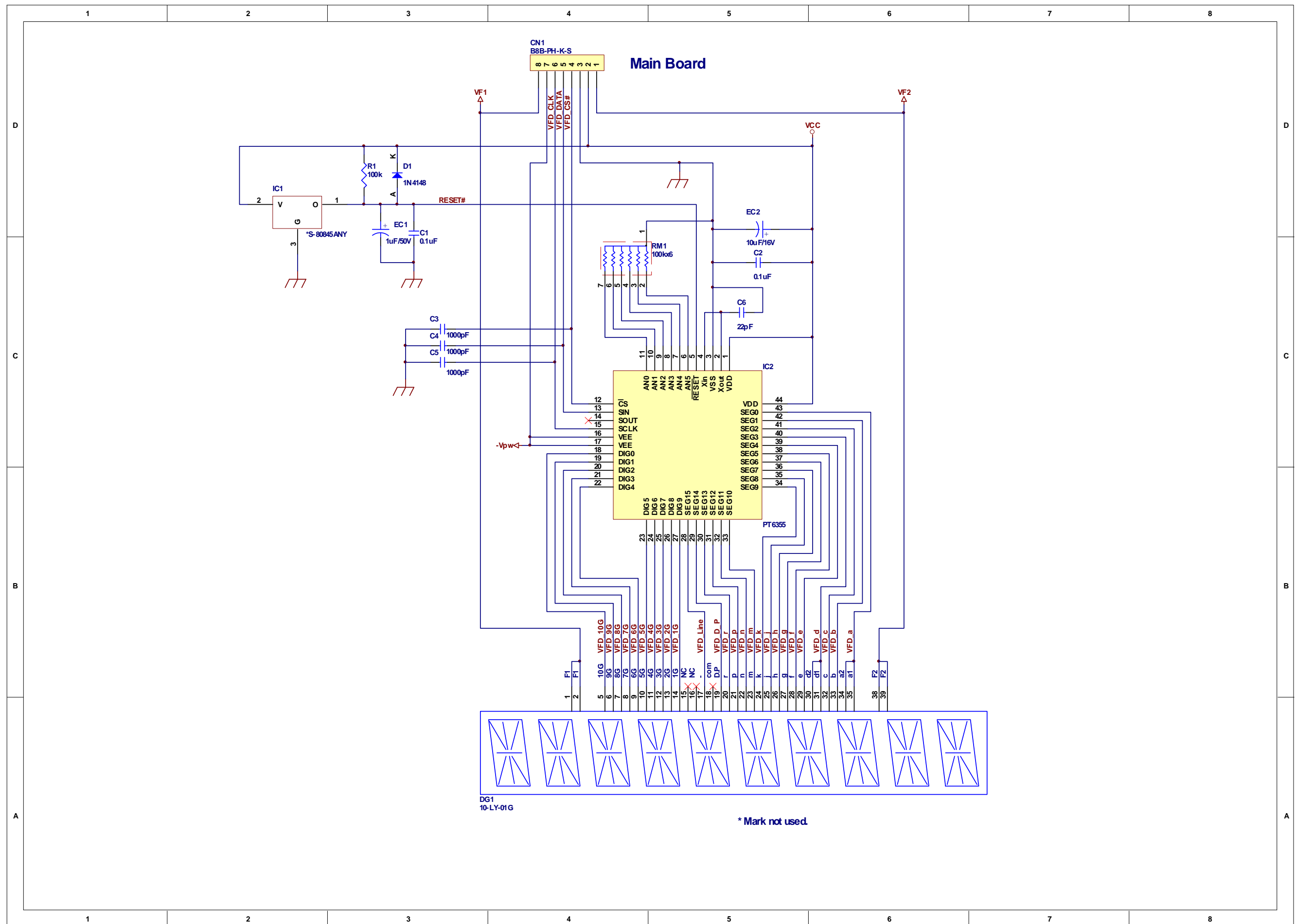












9. EXPLODED DIAGRAM

Exploded diagram of the ROYAL ALPHA 710ML device. The diagram shows the main unit with various components labeled with numbers 1 through 72. Key components include the keypad (1-6), display (12), internal modules (22, 23, 35, 36, 37, 38X3, 38X2, 39, 40, 41X2, 42, 43, 44, 45, 46, 47, 48, 49X4, 49X2, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66), and various connectors and cables (7X1, 7X5, 8X2, 9X4, 10, 11, 13, 14, 15, 16, 17, 24, 25, 26, 27, 28, 29, 30, 31, 34, 35, 36, 37, 38X3, 38X2, 39, 40, 41X2, 42, 43, 44, 45, 46, 47, 48, 49X4, 49X2, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66). A note indicates 'Gnd wire from Ac cord' for part 65.

| NO. | PART NO. | PART NAME | Q'TY |
|-----|----------|-----------|------|
| 1.  |          |           |      |
| 2.  |          |           |      |
| 3.  |          |           |      |
| 4.  |          |           |      |
| 5.  |          |           |      |
| 6.  |          |           |      |
| 7.  |          |           |      |
| 8.  |          |           |      |
| 9.  |          |           |      |
| 10. |          |           |      |
| 11. |          |           |      |
| 13. |          |           |      |
| 14. |          |           |      |
| 15. |          |           |      |
| 16. |          |           |      |
| 17. |          |           |      |
| 20. |          |           |      |
| 21. |          |           |      |
| 22. |          |           |      |
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| 27. |          |           |      |
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| 31. |          |           |      |
| 32. |          |           |      |
| 33. |          |           |      |
| 34. |          |           |      |
| 35. |          |           |      |
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| 38. |          |           |      |
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| 41. |          |           |      |
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| 51. |          |           |      |
| 52. |          |           |      |
| 53. |          |           |      |
| 54. |          |           |      |
| 55. |          |           |      |
| 56. |          |           |      |
| 57. |          |           |      |

| REVISION DETAILS | REVISION    | MODEL NAME        |
|------------------|-------------|-------------------|
|                  | SCALE       | ROYAL ALPHA 710ML |
|                  | DATE        | TITLE             |
|                  | PREPARED BY | EXPLODED DIAGRAM  |
|                  | CHECKED BY  | DRAW. NO.         |
|                  | APPROVED BY | EBZ-0610          |